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UNIVERSITY OF MINNESOTA
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bulletin

NEWS AND VIEWS IN THE BIOLOGICAL SCIENCES

Vol. IV JULY • 1954 No. 3

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published by

THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

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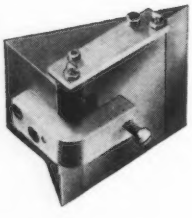

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EDITORIAL

Better Communications By 1960

WILLIAM R. DURYEE

Chairman, AIBS Publications Committee

IN the 17th century it was usually possible for an author to begin his leisurely scientific treatise with a polite dedication and a friendly appeal to "The Gentle Reader." But now, in the pressure and hurry of modern times, a scientific article is lucky if it can claim five minutes from the reading public. Of course this is not always the case, but nevertheless most biologists freely admit that keeping up with the literature has become a perplexing and most difficult problem—not only do the number of biological journals increase, but time and leisure for reading and thoughtful study steadily seem to decrease. In 1954 The Gentle Reader is hard to find.

As biological scientists we cannot remain indifferent to advancing knowledge and new techniques. Whether by the written word or the spoken one we have the duty to know, weigh, and understand our colleagues' contributions and we must become ever more aware of significant new results in the related fields of physics and chemistry. A real question is—what can the AIBS do to help with the problems of interchange of scientific ideas?

Some years ago the AIBS established a Committee on Publications. Its scope has slowly broadened to include not only the problems of helping journals and editorial staffs, but also the more general aspects of intercommunication of research results. It is interested in problems involving indexing, abstracting, access to data and even easier reading and more efficient utilization of published knowledge. The committee is well aware that in these areas science is confronted with a dilemma of almost heroic magnitude.

A harsh critic might say that the most unscientific thing about modern science is how it does business. He might point out that we write more and more articles, books, reviews, speeches, and, yes, editorials. Yet we insist on using a system, centuries old, of publishing bulky papers with charts, tables and illustrations and expensively pushing these into the already overcrowded libraries of the world. Our large scientific meetings have tended to become a series of hurried papers, run off in simultaneous batches. It is extremely difficult to escape the conclusion that there are just too many words in our libraries, too many articles, too many journals, too many books, and too little organization of our ideas. Approximately 40,000 technical and scientific journals are published throughout the world. Of this number, over 20,000 are in the field of biology. In the United States the *Library of Congress* takes over half of this world's total in biology (approximately 12,000) while most of the other large libraries subscribe to about 2,000 per year. *Biological Abstracts* uses some material from about 2,000 journals but is able to do a complete coverage of only 200. When it is realized that an average biologist can read only about 4 or 5 journals carefully and skim the titles of say 20 or 30 more, we might well ask the question: Is science defeating its own purposes?

A pessimistic viewpoint is, therefore, understandable but not wholly justified. Scientists and enterprising individuals may always improve matters. New and exciting techniques are already at hand. Scientific organizations such as The National Research Council, the National Science Foundation, the British Royal Society, and UNESCO have, to name but a few, begun to attack the problem at various levels. Your AIBS, through its Publications Committee, is likewise interested and is now planning a long-range program.

At the Gainesville meeting in September of this year an unusual and worthwhile symposium has been planned by this Committee. Special credit is due to John A. Behnke for his efficient organization of the program, which is entitled "The Communication of Research Results." It is particularly desirable that as many editors and interested scientists as possible attend. Your cooperation, criticism and constructive suggestions are requested. Please mark the date, September 7, 1954, on your calendar.

James Bonner has consented to be Chairman of this Symposium. The first paper will be that of the writer on "A Blueprint for the Storage and Rapid Dissemination of Research Results." I shall attempt to formulate our Publications Plan for 1960. It will be shown that a *single* indexing and abstracting system would, like a telephone book, give rapid access to the basic papers. These, in their bulky form, could be key indexed and *editorially* deposited in say five regional libraries. Journals of the future need to be streamlined and compressed to cover adequately new advances. By utilizing new machine indexing and duplicating systems, interested readers could quickly obtain photoreproductions of papers they needed. Printed words must be minimized and the economic burden of reprinting shifted slowly from the author to the consumer.

Next, Richard M. Hewitt of the Mayo Foundation is scheduled to discuss "Better Preparation of Material." This will include not only ways to improve our present manuscripts, charts and illustrations, but also new psychological ways to interest the reader.

Any plan for the future must depend upon new and perhaps still uninvented methods for reproducing information. Robert Bray of the Library of Congress is specially qualified to discuss the newest photographic and electronic techniques of the library world and to suggest specifications for tailor-made systems that would make library work a treat instead of a treatment.

A pioneer in the struggle to improve classification, storage and searching of library material is Ralph R. Shaw. His first model of the *Rapid Selector* Machine has so impressed the Publications Committee that they have used their good offices to urge several governmental agencies to find substantial funds to develop an improved table model. Dr. Shaw will describe this remarkable prototype, now in the U. S. Department of Agriculture Library.

Finally, a former Chairman of the AIBS Governing Board, Ralph E. Cleland, will discuss the better use of published material. His viewpoint is that both enlightened self-interest and the welfare of a society which depends for much of its well-being on science, demands that scientific contributions be made more acceptable to the intended consumer. No matter what new devices are used the end result by 1960 should be the improved dissemination of more significant biological knowledge.

Across the Editor's Desk

• Announcement has been made by the National Academy of Sciences—National Research Council about the **three Merck Senior Postdoctoral Fellowships in the Natural Sciences** for the academic year 1954-55. *Edward W. Fager,* working at the Bureau of Animal Population, Oxford University under Dr. Charles Elton had his fellowship renewed and will continue his quantitative studies of the succession of animal communities in logs. *Florence Moog,* Washington University, was the second recipient and will do research on the influence of adrenocortical hormones on juvenile development of the mouse with special reference to the functional differentiation of the small intestine. Dr. Moog will work at the Molteno Institute, Cambridge, England under the leadership of Professor T. Mann. *Carl M. Stevens,* State College of Washington, was the third winner. He will make studies of nucleic acid metabolism in *Neurospora* at the California Institute of Technology under the supervision of Professors G. W. Beadle and H. K. Mitchell.

The Merck Senior Postdoctoral Fellowships in the Natural Sciences are open to U.S. citizens who have had training in physics, chemistry or biology equivalent to a Ph.D. degree and who have had at least three years of professional experience in their major field.

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• **Three Lilly Research Laboratories Postdoctoral Fellowships** have been awarded for the academic year 1954-55. These Fellowships were established in 1952 and are administered by the National Academy of Sciences-National Research Council. *Sterling G. Bradley,* Northwestern University, whose major field of interest is microbiology, will conduct research on genetic studies with the Actinomycetes at the University of Wisconsin under the direction of Dr. J. Lederberg. *Thomas C. Bruice,* University of Southern California, will make studies of model peptidases at the University of California at Los Angeles, under the direction of Dr. T. A. Geissman. *Duane T. Gish,* Cornell University, received a renewal award to continue his studies on the problem of the synthesis of beef vassopressin at the Medical College of Cornell University under the direction of Dr. Vincent du Vigneaud.

The Lilly awards are postdoctoral, limited to those who hold a Ph.D. or Sc.D. degree (or equivalent), and who have demonstrated superior ability for creative research. The fellowships are available in those sciences fundamental to the understanding of biological phenomena, especially in the borderline fields between chemistry, biology and physics.

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• Six promising young scientists have been awarded **National Research Council Postdoctoral Fellowships in the Natural Sciences** for the academic year 1954-55. These Fellowships are supported by the Rockefeller Foundation and administered by the National Academy of Sciences-National Research Council. *Richard C. Blanchfield,* Princeton University, whose major field is mathematics, will conduct research on the knot theory in 3-manifolds at the Massachusetts Institute of Technology under the supervision of Dr. Witold Hurewicz. *Charles W. Curtis,* University of Wisconsin, also a mathematician, will conduct research on the ideal theory in non-commutative rings, and the theory of representations of algebraic systems at the Institute for Advanced Study, under the supervision of Professor Deane Montgomery. *Theodore Delevoryas,* University of Illinois, will work on the morphology of plant fossils at the University of Michigan, under the guidance of Dr. Chester A. Arnold. *Frank S. Ham,* Harvard University, whose major field of interest is physics, will continue his research on energy bands of alkali metals and will also work on theoretical problems in the area of ionic crystals and semi-conductors at the University of Illinois with Professor J. Bardeen. *James B. Henrickson,* Harvard University, will conduct research on the elucidation of the structures of cucumin and leptodermin at Birbeck College, University of London, under the supervision of Professor D. H. R. Barton. *Norman E. Phillips,* University of Chicago, will make studies of the heat capacities of some super conductors with low transition temperatures at the University of California at Berkeley, under the supervision of Professor K. S. Pitzer.

The National Research Council Postdoctoral Fellowships in the Natural Sciences were established in 1919 by the Rockefeller Foundation for the advancement of chemistry and physics. Within a few years, the program was broadened to include the medical, biological and earth sciences. Since these awards were begun, over 1,300 Fellows have conducted research at nearly 150 universities and research institutions in the United States and abroad.

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• **Lilly Research Laboratories Postdoctoral Fellowships in the Medical Sciences** have been conferred upon four young scientists for the academic year 1954-55. *Dorothy J. Buchanan,* Maryville, Tennessee, will continue her second year of research on enzymatic degradation of blood-group-specific substances at the Lister Institute of Preventive Medicine, London, England, under the direction of Dr. W. T. J. Morgan. *Gaylord M. Conzelman, Jr.,* Santa Ana, California, also received a renewal award to continue his studies at the Christ Hospital Institute of Medical Research, Cincinnati, Ohio, under the direction of Dr. L. H. Schmidt. His research concerns the fractions of certain 8-aminoquinolines (antimalarial drugs) which have harmful effects on the blood. *David G. Cornwell,* Lacomb, Oregon, is to make an investigation of plasma lipoproteins at Harvard University, under the direction of Dr. J. L. Oncley. *Joseph C. Shipp,* Northport, Alabama, will study the functions of the kidney tubule, at Harvard Medical School, under the direction of Drs. George Thorn and A. K. Soloman.

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• **National Academy of Sciences-National Research Council Postdoctoral Fellowships in the Medical Sciences** have been awarded to five young scientists for the academic year 1954-55. *Jack Barrow,* Carbondale, Illinois, will continue his second year of study at the Washington University School of Medicine under the direction of Dr. W. Barry Wood, Jr. His research concerns the relationship between the water content of bacteria and their capsules and the rate at which they are captured by phagocytic cells of the blood and reticulo-endothelial system. *Sheldon B. Gertner,* Brooklyn, N. Y., also received a renewal award to continue his investigation of the release of chemical transmitters during nerve stimulation and the mechanisms concerned in the failure of transmission during prolonged stimulation. Dr. Gertner is studying at the National Institute for Medical Research, London, England, under the direction of Dr. Wm. Feldberg. *John H. Luft,* Charlestown, Mass., will study the morphology and histo-chemistry of the electric organ of the eel (*E. electricus*) in comparison with striated muscle, at the Harvard Medical School, under the direction of Dr. George B. Wislocki. *Sholem Postel,* Cincinnati, Ohio, received a second-year award to continue his studies on detection, isolation and physiology of thyroid stimulating hormone in body fluids, at the Massachusetts General Hospital, Boston, Mass., under the direction of Dr. John B. Stanbury. *Jonathan G. Wegener,* Chicago, Ill., will study some integrative functions of the cerebral cortex, at the Institute of Living, Hartford, Conn., under the direction of Dr. Karl H. Pribram.

• **Horace W. Stunkard,** chairman of the graduate and undergraduate divisions of biology at the University Height campus of New York University since 1925, will retire September 1954. A testimonial dinner was given April 23 to honor Dr. Stunkard's forty years of teaching service at NYU. After his retirement Dr. Stunkard will continue his experimental studies on the life cycles of parasitic flatworms, especially those found in the bloodstream. A specialist in schistosomiasis, Dr. Stunkard served as consultant to the Office of Scientific Research and Development during World War II. In this capacity he became concerned about the possible introduction of the disease into this country by American servicemen returning from the Pacific theater, and after examining thousands of snails, found a species capable of harboring the larval stages of *S. japonicum*. Dr. Stunkard was the first to identify the salt-water cercariae responsible for the dermatitis known as "swimmer's itch." His research into the life cycle of *Cryptocotyle lingua*, an intestinal parasite, won him the A. Cressy Morrison prize of the New York Academy of Sciences in 1929. Currently Dr. Stunkard is president of the Society for Systematic Zoology and a vice-president of the American Association for the Advancement of Science: he is past president of the American Society of Parasitologists, the American Microscopical Society, and the New York Society for Tropical Medicine. On occasional leaves from NYU, Dr. Stunkard has conducted research in England, France, and Germany. He is a member of 18 scientific societies and is the author of 144 scientific papers and reviews. Earlier this year he retired as editor of the *Journal of Parasitology*, a post he has held for 10 years.

Charles H. Willey will succeed Dr. Stunkard as head of undergraduate biology. **Harry A. Charipper,** chairman of the biology department on the Washington Square campus, will take on the graduate departments of biology on both campuses.

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• To assist scientists in carrying out part of their research program in Bermuda, **a grant covering a period of five years has been made to the Bermuda Biological Station by the National Science Foundation.** These funds, which are immediately available, will be awarded mainly to pay for research space, living expenses or special collecting facilities required while at the station. Applications for aid in purchasing equipment or necessary travel expenses may also be considered in relation to such a program. Application forms and a booklet describing the Bermuda Station will be sent upon request to the Director, Dr. William H. Sutcliffe, Jr., Bermuda Biological Station, St. George's West, Bermuda. Since grants will be made through a committee of Officers and Trustees of the Station formal application should be made as soon as possible.

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• **The Duke University Marine Laboratory, Beaufort, N. C., has received a grant of $12,000 from the National Science Foundation** to continue for the next three summers its program of offering ten predoctoral scholarships of $200 each for six weeks of course work or research. In addition, four postdoctoral grants of $500 each will be made to biology faculty from colleges and universities of the southeast, other than Duke University, for research in Marine Biology for a period of 12 weeks. This part of the program will start in the summer of 1955 and continue for three years. Inquiries concerning predoctoral scholarships for this summer should be addressed to Dr. C. G. Bookhout, Zoology Dept., Duke University, Durham, N. C.

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• **The University of Pennsylvania has announced the establishment of an Institute of Neurological Sciences** designed to offer a broad and integrated approach in the study of the nervous system and to train teachers and research personnel in this biological field. The Institute invites application for fellowships to be awarded annually and to be made available to students with diverse background seeking a Ph.D. degree in some phase of descriptive and experimental neurological sciences (embryology, anatomy, physiology, biochemistry, pharmacology, and physiological psychology). These fellowships offer a stipend of $1,200 to $1,800 per annum with tuition provided. Fellowships are also available for postgraduate investigators (Ph.D., M.D.); the stipends to be arranged according to need. Detailed information may be obtained from the office of the Director of the Institute of Neurological Sciences, Department of Anatomy, School of Medicine, University of Pennsylvania, Philadelphia 4, Pa.

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• **Eliot Stellar,** Assistant Professor of Psychology in the Johns Hopkins University, will join the Institute of Neurological Sciences of the University of Pennsylvania as a Member of the Institute and as Associate Professor of Physiological Psychology, beginning July 1, 1954.

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• **The Board of Trustees of the Missouri Botanical Garden recently announced the appointment of Edgar Anderson as Director,** to succeed George T. Moore, now Emeritus Director, who has held this position since 1912. In addition to his post as Director of the Gardens, Dr. Anderson will continue as professor of botany at Washington University. He first came to St. Louis in 1922 to serve as geneticist in the Garden and assistant professor of botany at Washington University. From 1931-35 Dr. Anderson served as arborist at the Arnold Arboretum, then returned to Missouri. Dr. Anderson was elected to the National Academy of Science this spring.

Hugh Carson Cutler, who has been Curator of the Museum of Economic Plants at the Missouri Garden, will become Assistant Director. Dr. Cutler has been associate professor of botany at Washington University since 1952 and is the former Curator of Economic Botany at the Chicago Natural History Museum.

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• **Future international scientific meetings,** not listed in the April 1954 *AIBS Bulletin:*

July 16-21. London, England. *International Conference on Electron Microscopy; Joint Commission on Electron Microscopy of International Council of Scientific Unions.* Joint Secretaries: Dr. C. E. Challice and Mr. F. W. Cuckow, Institute of Physics, 47 Belgrave Square, London, S. W. 1.

July 20-24. Pallanza, Italy. *Symposium on the Biological, Physical and Chemical Characteristics of the Profundal Zone of the Lakes, International Union of Biological Sciences with support of UNESCO.* Professor Vittorio Tonolli, Director, Istituto Italiano di Idrogiolobia, Pallanza (Novara).

August 31-Sept. 10. Rome, Italy. *World Population Conference,* Economic and Social Council of the United Nations in cooperation with specialized agencies of the UN and the International Union for the Scientific Study of Population. Professor Frank Lorimer, American University, Washington 16, D. C.

Sept. 13-17. Pretoria, South Africa. *International Scientific Committee for Trypanosomiasis Research, 5th Meeting.* Secretary of Committee, The Colonial Office, The Church House, Great Smith Street, London, S. W. 1.

October 5-8 (tentative). Madrid, Spain. *5th International Congress of Hydatid Disease.* Dr. Jesus Calvo Melendro, Hospital Provincial, Sorea, Spain.

October 15. Montevideo, Uruguay. *United Nations Educational, Scientific and Cultural Organization* (UNESCO), *General Conference, 8th Session.*

December 1-7. Sao Paulo, Brazil. *1st International Congress on Medicinal and Similar Plants.* Professor Dr. Paulo de Toledo Artigas, Rua Tres Rios 363, Sao Paulo.

December 11-22. Dehra Dun, India. *4th World Forestry Congress*, organized by the Government of India and sponsored by the Food and Agriculture Organization of the United Nations. Mr. Tom Street, Foreign Agricultural Services, U.S.D.A., Washington 25, D. C., or Organizing Committee, c/o Mr. M. D. Chaturvedi, Inspector-General of Forests, Ministry of Agriculture, New Delhi, India.

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• **The University of Michigan annual summer biological symposium** for 1954 will feature the subject of *Adaptation in Microorganisms.* Anyone interested may attend and the program is as follows:

Week of July 12-16, 1954.
Sol Spiegelman, University of Illinois. (1) The Transmission of Enzyme Synthesizing Capacity. (2) The Properties of the Enzyme Synthesizing Mechanism.
Joshua Lederberg, University of Wisconsin. (1) Mechanisms of Bacterial Adaptation Against Chemotherapy. (2) Serological Variations in *Salmonella.*

Week of July 19-23, 1954.
John R. Preer, Jr., University of Pennsylvania. (1) The Inheritance of Adaptive Responses in Protozoa. (2) The Cytoplasmic Factor, Kappa, in *Paramecium.*
Francis J. Ryan, Columbia University. (1) Randomness of Mutation in Bacteria. (2) Selective Mechanisms in Bacteria.

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• At the conclusion of the 1954 summer quarter **Stanford University will conduct its regular conference on Latin American affairs.** This year's topic will be **"The Population Problems of Latin America."** Those wishing to attend should apply to Dr. Ronald Hilton, Director, Hispanic American Studies, Room 255, Stanford University, Stanford, California. Program sections are as follows: (1) Population Trends in Latin America. (2) Resources, Climate and Population. (3) Health and Population Growth. (4) Economic Development and Population Growth. (5) Labor Migrations Across National Boundaries. A report on the Stanford conference will be prepared and sent to the World Population Conference to be held in Rome, August 31-September 10, under the auspices of the Economic and Social Council of the United Nations, in cooperation with the International Union for the Scientific Study of Population.

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• At the annual meeting of the **National Academy of Science,** in Washington, D.C., April 27, Detlev W. Bronk, President of the Rockefeller Institute for Medical Research, was re-elected President of the Academy for a four-year term. The following biologists were elected to membership in the Academy: *Edgar Anderson*, Washington University; *William Bloom*, University of Chicago; *Eugene M. Landis*, Harvard Medical School; *Ernst Mayr*, Harvard University; *Alfred E. Mirsky*, Rockefeller Institute for Medical Research; *Alexander Petrunkevitch*, Yale University; *Arnold R. Rich*, Johns Hopkins University; *Ralph H. Wetmore*, Harvard University.

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• **The National Science Foundation** has announced the appointment by the President of the following persons to serve as **members of the National Science Board:** Donald H. McLaughlin (reappointment), President of Homestake Mining Company; George W. Merck (reappointment), President of Merck & Company; Joseph C. Morris (reappointment), Vice-President of Tulane University; William V. Houston, President of Rice Institute; James B. Macelwane, Dean of Institute of Technology, St. Louis University; Douglas Whitaker, Provost Stanford University; Theodore M. Hesburgh, President, Notre Dame University; Roger Adams, Head Chemistry Department, University of Illinois. All terms will expire May 10, 1960.

• A preliminary announcement had been made of an **International Arid Lands Symposium and Conference** that will be held in Albuquerque and Socorro, New Mexico, April 27-May 2, 1955. The UNESCO Advisory Committee on Arid Zone Research sponsors conferences in even-numbered years (1954, New Delhi, India) and encourages other organizations to develop sessions in alternate years. The 1955 conference is being sponsored by the AAAS and the Southwestern and Rocky Mountain Division of the AAAS. Gilbert F. White, President of Haverford College, will serve as Chairman of the planning committee. The program will be divided into four subject sections (meeting successively): Anthropology and Archaeology; Biology and Ecology; Meteorology and Climatology; Geology, Hydrology, and Soils. Anyone desiring further information should contact Dr. White.

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• **The Thirty-First Annual Plant Science Seminar of the University of Connecticut** will be held August 18-21, 1954. Dormitory rooms, costing $1.75 per person per day, will house registrants and the University dining hall will serve meals, cafeteria style. All interested persons are asked to register as soon as possible and send the following information to: Dr. A. E. Schwarting, College of Pharmacy, University of Connecticut, Storrs, Conn. Date of arrival. Mode of travel. Family members or guests attending (list ages of children). The tentative program includes, as dinner speaker, W. L. Camp, "Taxonomy and Variation." Several field trips and tours are planned in conjunction with the Seminar.

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• **Rollin D. Hotchkiss,** discoverer of hitherto unknown factors in the development of bacterial resistance to antibiotics, was awarded the Commercial Solvents Award for Outstanding Research in Antibiotics during the recent annual meeting of the Society of American Bacteriologists in Pittsburgh. Dr. B. C. van Niel, President of the SAB, presented the award, which consists of a gold medal and $1,000. Dr. Hotchkiss, who is an Associate Member of the Rockefeller Institute for Medical Research, worked principally with *Diplococcus pneumoniae*, the organism causing lobar pneumonia.

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• A notice of importance to biologists has just been received. **Research proposals directed to the Division of Biological and Medical Sciences of the National Science Foundation will be received at any time.** Proposals on research projects to begin the second half of the academic year 1954-55 will be reviewed during October, 1954. These proposals should be received by the Foundation prior to September 15, 1954.

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• **Training programs,** many of interest to biologists, **are offered** regularly throughout the year **by the Sanitary Engineering Center of the Department of Health, Education and Welfare at Cincinnati, Ohio.** Notice about a course in Advanced Training for Aquatic Biologists, June 8-11, arrived too late for inclusion in the April *Bulletin* but a catalogue of future courses may be obtained from the Director, Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

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• Organized in September 1953, the new **Conservation Education Association** aims to "stimulate the development of sound education with respect to resource-use." A national organization, it is open to all interested persons or groups wanting to work actively and cooperatively on conservation and resource-use education. The officers are: President, A. G. Peterson; Honorary President, John W. Scott; Vice-President, Howard Michaud; Treasurer, William Voigt, Jr.; Secretary, Richard L. Weaver, Conservation Dept., University of Michigan, Ann Arbor, Michigan.

• **Philip V. Rogers,** professor of biology at Hamilton College, Clinton, N. Y., who has spent the past year on a Ford Foundation research grant at Stanford University, will return to the faculty this summer. His replacement, **Charles H. Southwick,** will be going to the Oxford University Bureau of Animal Behavior for a year of research under a National Science Foundation Fellowship.

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• **Paul Weiss,** Professor of Zoology and Chairman of the Divisional Biology Sequence, University of Chicago, and Chairman of the Division of Biology and Agriculture, National Research Council, is leaving the University, effective July 1, 1954, to become a Member of the Rockefeller Institute for Medical Research in New York, where he will head a new Laboratory of Developmental Biology. In June, Dr. Weiss will attend a meeting in Paris of the Policy Board of the International Union of Biological Sciences, of which he is Chairman.

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• **The new Institute of Microbiology of Rutgers University** (The State University of New Jersey) is a division of the University, housed in its own building on the new University Heights campus on the east bank of the Raritan River, north of New Brunswick. This three and one-half million dollar monument to the discovery of streptomycin by Dr. Selman A. Waksman was dedicated on June 7, 1954, not as an imposing structure in Georgian Colonial architecture, which it is, but as a place where the science of microbiology can go forward for the benefit of mankind.

As June 7 was a bright, clear day, the dedication convocation was held on the lawn in front of the new building. Several hundred people gathered there to hear addresses by Lewis Webster Jones, President of the University; Selman A. Waksman, the first Director of the Institute; and Albert J. Kluyver, Technical University, Delft, Holland, speaking for the microbiologists of the world in appreciation of Dr. Waksman and the advance in microbiology made by him and made possible by him through his new institute. Following his address, Professor Kluyver received from President Jones the honorary degree of Doctor of Science. The same degree was presented to two other distinguished foreign scientists, Jacques Trefouel of France, and Hans Karl von Euler-Chelpin of Sweden. Five American scientists were likewise honored: O. T. Avery, G. W. Beadle, R. E. Buchanan, R. E. Shope, and C. B. van Niel. Previously unannounced was the presentation to Dr. Waksman by one of his students of a bronze plaque to be placed in the Institute Building to remind all who enter, in Dr. Waksman's own words, of the purpose of the Institute.

The Institute is to be concerned primarily with fundamental research in all aspects of microbiology. However, it will also develop applications of microbiological knowledge to human welfare and will engage in a graduate and postdoctorate training program. The building is well equipped for all these purposes.

Following the dedication and inspection of the building of the Institute, there was a reception at the President's House and a large banquet in the University Commons on the old campus. Each table at the banquet was headed by a member of the Rutgers faculty as host. There the guests had opportunity to hear Dr. Trefouel and Dr. von Euler-Chelpin.

On June 8 and 9 the dedication events were concluded by a symposium on "Perspectives and Horizons in Microbiology." Held in the lecture hall of the Institute, the symposium was limited to invited speakers and guests.

From the Editor

IN its Constitution, a "member" of AIBS is defined as a member of a member society. Every member of the 18 member societies has automatically become a member of AIBS. To be sure, the Constitution provides that an individual may object to this automatic procedure and may exempt himself from it by merely stating in writing that he does not wish to be regarded as a member of AIBS while he remains a member of a member society. No one to our knoweldge has taken the trouble to reject automatic membership in AIBS. It may be assumed that this lack of protest against membership by definition does not represent unanimous approval of it but rather a vast indifference toward it.

Is it not characteristic of human nature to value most the desirable things of life that are obtainable only by conscious effort or by unsought reward of effort or by voluntary expenditures of money representing past effort? Thus in the realm of membership, one values most his membership in organizations that cannot be entered automatically or even at his own volition—organizations that are selective, into which one can enter only by invitation, and in which membership signifies recognition of achievement.

Of lower value, but still valuable, are those memberships that an individual chooses to buy, particularly in those societies that have qualifications for membership, which, if met, indicate that the member has some professional status and competence. Of equal value, perhaps, are memberships, for which an individual pay dues, in organizations having a purpose or mission with which he wishes to be identified. Generally speaking, the value of voluntary membership is likely to be proportional to the cost of membership, both in service to the member and in his appreciation of membership.

The lowest possible value attaches to present membership in AIBS. The average member of a member society is probably not aware of the fact that he himself, as an individual, is a member of AIBS. He is not conscious of supporting AIBS or of receiving anything of value to him from the Institute, except, perhaps, an occasional slice of useful information from the Bulletin. He gains no prestige from his automatic membership, no recognition of professional status, not even the satisfaction of having personally made a small financial sacrifice for a cause in which he believes. If AIBS has reality for him, it takes the form of an annual meeting for which he pays a registration fee on the spot.

The Governing Board realizes that an attempt must be made to rescue AIBS from the dead weight of automatic individual memberships and gradually to transform the membership from involuntary to direct dues-paying voluntary, without disturbing the society memberships. Full explanation of a new plan for individual memberships will be given in the October issue of the *Bulletin.* There is one biologist, at least, who did not wait to be invited. After reading the previous editorial, he, although a "member" of AIBS, offered to pay five dollars a year for the *Bulletin.* We have restrained him until his contribution can be accepted as dues for his individual voluntary membership in AIBS. We ask others so inclined to hold their checks until approved rules and procedures can be set up.

All members of Member Societies that plan to meet at Gainesville will receive their General Programs *in the mail* during August. *All* others will receive their Programs at the Registration Desk. **Extra copies will cost $1.00.**

From the Societies

• **Rudolph T. Kempton,** Professor of Zoology at Vassar College, **has been appointed Secretary of the American Society of Zoologists** to complete the term of S. Meryl Rose, who has resigned.

• **The Thirteenth Growth Symposium** will be held at Dartmouth College, Hanover, New Hampshire, June 23-26, 1954. Persons interested in this field, but not members of the Society, will be welcome to attend to the extent that facilities are available. The speakers and program are as follows: (June 23) Roger Stanier, "Plasticity of Enzymatic Patterns in Microbial Cells"; Seymour Cohen, "The Transformation of Bacterial Metabolism Induced by Virus Infection"; Ralph Emerson, "The Biology of Water Molds." (June 24) Dietrich Bodenstein, "Insect Morphogenesis"; Clifford Grobstein, "Tissue Interaction in the Morphogenesis of Mouse Embryonic Rudiments *in Vitro*"; E. S. Russell, "Review of Pleiotrophic Effects of W-Seris Genes on Growth and Differentiation." (June 25) Linus Pauling, "Duplication of Molecules"; Joseph S. Fruton, "The Biosynthesis of Proteins and Peptides"; James Ebert, "Aspects of Protein Bio-Synthesis in Development." (June 26) Sterling Hendricks and Harry Borthwick, "Photoresponsive Growth Control"; Nelson T. Spratt, Jr., "Studies on the Organizer Center of the Early Chick Embryo."

• At the **15th annual meeting of the Association of Southeastern Biologists,** held recently at the Louisiana State University, the following new officers were elected for 1954: President: H. R. Totten, University of North Carolina; President-elect: Alvin V. Beatty, Emory University; Vice-President: Fred T. Wolf, Vanderbilt University. Mary Esther Gaulden, Secretary, and J. Paul Reynolds, Treasurer, will both continue in office during 1954. Harold Humm, Florida State University, and Ruth McClung Jones, Winthrop College, were elected to three-year terms on the Executive Committee.

The ASB Meritorious Service Award of $100, presented by the Southern Scientific Company, was presented to W. B. Baker, Emory University. The Phipps and Bird Fellowship of $200 for study at the Mountain Lake Biological Station was awarded to Benjamin I. Johns of Alexandria, Virginia. The Association's Research Prize, offered annually by the Carolina Biological Supply Company, a $100 award for the best paper presented at the meeting, went to William J. Brett of Millsaps College, Jackson, Mississippi, for his paper entitled, "Persistent diurnal rhythmicity in *Drosophila emergence.*" Honorable Mention in the award competition went to J. H. Gregg, Alice Hackney, and J. O. Krivanek of the University of Florida, for a paper entitled "Nitrogen Metabolism of whole and fragments of the slime mold, *Dictyostelium,* during growth and morphogenesis." The annual address of the meeting was given by Edgar Anderson, Director, Missouri Botanical Garden on "*Rosa alba,* The White Rose of the Renaissance." The 1955 annual meeting of ASB will be held in Charleston, S. C.; the host institution being The Citadel, the Military College of South Carolina.

• **The first edition of the new *ASB Bulletin,*** official quarterly publication of the Association of Southeastern Biologists, appeared in March. Victor A. Greulach, University of North Carolina, is Editor. Present tentative plans for the journal "call for quarterly issues of from 16 to 20 pages, each containing a letter section, one or two articles, a section for announcements from the secretary, a news section, and a section devoted to miscellaneous Association publications." At the present time the *Bulletin* will not publish research papers, although a section may be added at some later date for short (500 to 1500 word) papers.

• **"Results of 1953 Fungicide Tests"** reprinted from a series of articles appeared in *Agricultural Chemicals* January through March may be purchased in bound and covered form for $1.00 per copy by sending orders with remittance to Dr. W. D. Mills, Department of Plant Pathology, Department of Agriculture, Cornell University, Ithaca, New York. The publication of these Results is under the sponsorship of the American Phytopathology Society. It is a continuation of the publication of results formerly provided through a Supplement of the Plant Disease Reporter, Plant Disease Survey, U. S. Department of Agriculture. The underwriting of this project was accomplished through contributions from many commercial companies identified with Pesticide Industry. The Temporary Advisory Committee on Collecting and Disseminating Data on New Fungicide Tests of the American Phytopathological Society arranged for the recent publication of data and the establishment of a program for annual publications of Fungicide Test Results in the future. Dr. D. A. Roberts, Department of Plant Pathology, Cornell University, Ithaca, New York, will be in charge of this project during the current year.

• **The National Association of Biology Teachers** has announced some changes among its officers. John Harrold has requested relief from his duties as Secretary-Treasurer, a position he has held for many years. He will be succeeded by Paul Webster, Bryan City High School, Bryan, Ohio. Effective March 1, 1954 the official publication of NABT, *The American Biology Teacher,* will be co-edited by Paul Klinge, Thos. Carr High School, Indianapolis and Dr. Richard Armacost, Purdue University.

The NABT has been named the recipient of a $15,000 National Science Foundation grant. The grant will be used to conduct a ten-day work conference, August 28-September 6, in conjunction with the annual AIBS meeting at the University of Florida. The conference will bring together life science teachers in colleges, elementary and high schools, school and college administrators, members of state departments of education, and outstanding scientists. It is planned that this group will study the problems in teaching the life sciences and plan improved programs for training teachers and building more effective curricula. Samuel L. Meyer, Florida State University, and Richard L. Weaver, University of Michigan, are co-directors of the Conference and will work with a Steering Committee, composed of NABT officers and members.

The A.I.B.S. Reports

• The manuscripts appearing in this issue of the *AIBS Bulletin* were planned to highlight some of the problems that exist in scientific communication. This subject will also be featured during the Gainesville meetings in a symposium, **"The Communication of Research Results,"** planned by the Publications Committee of the AIBS, long interested and active in this field. **James Bonner,** California Institute of Technology, will be chairman of this special symposium and the speakers are as follows:

William Duryee, National Cancer Institute and Chairman, AIBS Publications Committee. *"Introduction: A Blueprint for the Storage and Rapid Dissemination of Research Results."*

Richard M. Hewitt, Assistant Professor of Medical Literature and Senior Consultant, Division of Publications, Mayo Clinic. *"Better Preparation of Material."*

Robert Bray, Deputy Chief, Technical Information Division, Library of Congress. *"Modern Reproduction of Material."*

Ralph Shaw, Librarian, U. S. Department of Agriculture. *"Indexing and Rapid Differential Selecting of Material."*
Ralph E. Cleland, Professor of Botany, Indiana University. *"The Use of Material."*

• **Societies participating in the AIBS meeting in Gainesville, Florida,** are:

American Bryological Society
American Fern Society
American Society for Horticultural Science
American Society for Human Genetics
American Society of Ichthyologists and Herpetologists
American Society of Naturalists
American Society of Limnology and Oceanography
American Society of Plant Physiologists
American Society of Plant Taxonomists
Biometric Society (ENAR)
Botanical Society of America
Ecological Society of America
Florida Association of Science Teachers
Genetics Society of America
Mycological Society of America
National Association of Biology Teachers
Nature Conservancy
Phi Sigma
Phycological Society
Sigma Delta Epsilon
Society for Industrial Microbiology
Society of Protozoologists
Society for the Study of Evolution
Society of Systematic Zoology

• **Eastern Air Lines** is the only airline operating into Gainesville, Florida. The company has offered to provide supplementary service beyond that normally scheduled for the convenience of those attending the AIBS meetings. Those interested should advise their local agents who will contact Eastern Air Lines in Jacksonville, Florida.

• **Sixteen field trips have been completely or tentatively planned in connection with the Gainesville AIBS meetings.** The means of transportation and cost will depend upon the number of persons taking part. Last date noted is final date for reservations. Any person attending the meetings may take part in the field trips by contacting the leader listed.

A. Trips Starting at Gainesville.

1. Southern Florida, Miami, Everglades Park, and Keys region. 4 days, 3 nights; Sept. 2-5. To Miami via Lakeland, Sebring, the Everglades; return via Atlantic coast, Orlando. Two days at University of Miami and 3 trips each day from there. *Ecological Society*, J. H. Davis, Dept. of Botany, U. of Florida, Gainesville. Place on bus available only if cancellations occur. August 15.

2. Commercial citrus and vegetable production and processing; ornamental nurseries and gardens; subtropical fruit plantings and sugar cane production and processing. 3 days, 2 nights; Sept. 2-4, by bus. *Amer. Soc. for Horticultural Science*, F. S. Jamison, Agricultural Exp. Station, U. of Florida, Gainesville. August 20.

3. Near Gainesville, Magnesia Springs, Gulf Hammock, Buzzards Roost. One trip each day. Sept. 3, 4, 5. *Mycological Society*, Erdman West, Agri. Exp. Station, U. of Florida, Gainesville. August 25.

4. Ocala National Forest. One day, Sept. 4. *Amer. Soc. Plant Taxonomists*, Lillian Arnold, Herbarium, Agric. Exp. Station, U. of Florida, Gainesville, August 15.

5. Aquatic Localities. Silver Springs, Orange Springs, Marineland. One day, Sept. 5. *Amer. Soc. Limnology & Oceanography*, H. T. Odum, Dept. Biology, U. of Florida, Gainesville. Sept. 1.

6. Near Gainesville. Newnan's Lake, Devil's Millhopper, morning and afternoon, Sept. 5. *Amer. Soc. Plant Taxonomists*, Lillian Arnold, Herbarium, Agri. Exp. Station, U. of Florida, Gainesville. August 15.

7. Silver Springs, Ross Allen Reptile Institute. Afternoon, Sept. 5. *Amer. Soc. Ichthyologists and Herpetologists*, W. A. Auffenberg, Dept. Biology, U. of Florida. August 15.

8. Juniper Springs in Ocala National Forest. One day, Sept. 5. *Amer. Bryological Society*, Ruth S. Breen, Dept. Botany, Florida State University, Tallahassee. August 25.

9. Near Gainesville. Afternoon, Sept. 7. *National Association of Biology Teachers*, N. E. Bingham, College of Education, U. of Florida, Gainesville. Sept. 6.

10. Fresh Water Habitats south of Gainesville, Rainbow Springs, Crystal River, Homosassa Springs. One day, Sept. 8. *Phycological Society*, L. A. Whitford, Dept. Botany, N. C. State College, Raleigh, N. C. August 25.

11. Yerkes Primate Laboratory, Orange Park. One day, Sept. 8. Social Organization Section of *Ecological Society*, J. P. Scott, Jackson Memorial Laboratory, Bar Harbor, Maine. August 25.

12. Near Gainesville and south. One trip each day, Sept. 8, 9. *Amer. Fern Society*, John Beckner, 736 Myrtle Way South, St. Petersburg, Florida. August 15.

B. Trips Starting at Tallahassee.

13. Alligator Harbor Marine Laboratory of Florida State University. 5 days, Sept. 1-5. Boats and facilities available. *Phycological Society*, H. J. Humm, Oceanographic Institute, Florida State University, Tallahassee. August 25.

14. Apalachicola River Bluffs, Torreya State Park. One day, Sept. 3. *Amer. Bryological Society*, Ruth S. Breen, Dept. Botany, Florida State University, Tallahassee. August 25.

C. Trips Starting at Miami.

15. Three regions south of Miami; Florida Keys, Everglades National Park, Coral Reefs. This is part of trip #1. Two days, Sept. 3, 4. *Ecological Society*, Roy Woodbury, Dept. Botany, University of Miami, Coral Gables. August 15.

16. Southern Florida; to Gainesville via Clewiston, Ft. Meade, Tampa. 4 days, 3 nights. Sept. 1-5. *Amer. Fern Society*, John Beckner, 736 Myrtle Way South, St. Petersburg, Florida. August 15.

• **Hiden T. Cox,** Deputy Executive Director of the AIBS during the past year, will return, September 15th, to Virginia Polytechnic Institute, where he is Professor of Botany. In addition to his duties as Deputy Director, Dr. Cox has also served as Convention Director of the AIBS and in this capacity has planned the forthcoming Gainesville meetings. Under his direction the AIBS Placement Service was reorganized to better meet the needs of young biologists. He has handled the meetings of the AIBS Advisory Committees to the Office of Naval Research. The National Register of Scientists was organized and initiated by the National Science Foundation during the past year and Dr. Cox set up the staff and plans for handling the distribution and coding of questionnaires sent to the members of over 40 biological societies. His continual and expert liaison with other scientific organizations, Government agencies and universities has kept the AIBS in contact with all others similarly engaged in advancing biology on a national or international scale. Dr. Cox's long-standing interest in publications was evidenced in a recent announcement from the Blakiston Company, Inc., New York, appointing him consulting editor of the new Blakiston Publications in the Plant Sciences.

The Biology Library

One copy of each publication submitted for listing should be sent to the Editor, The AIBS Bulletin, 2101 Constitution Avenue, Washington, D. C. Only books published within a year of receipt will be reviewed. Older books will be listed.

ANIMAL SCIENCES

Histology. Edited by ROY O. GREEP. 953 pages, 648 figures, several in color. The Blakiston Company, 575 Madison Avenue, New York 22, N. Y. (1954) $15.00.

This large volume is the joint effort of various persons concerned, at one time or another, with the teaching of microscopic anatomy to medical and dental students at Harvard University. The authors have dealt almost exclusively with the human body. Although morphology has been the paramount consideration throughout the book, an attempt has been made to provide information about the chemical composition of the tissues as well. The book is well illustrated: many new drawings are included as well as a liberal sprinkling of colored plates. Contributors are: Russell Barrnett, R. L. Carpenter, H. W. Deane, E. W. Dempsey, D. W. Fawcett, Roy O. Greep, E. H. Leduc, M. H. Lurie, G. F. Odland, Marcus W. Singer, R. F. Sognnaes, L. P. Weiss, and G. B. Wislocki.

Animal Control in Field, Farm and Forest. W. ROBERT EADIE. 257 pages. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (1954) $3.75.

This is a unique book. A large and scattered literature on wildlife management and economic mammalogy exists but not until now have the problems of control and the methods of control, both artificial and natural, been incorporated into one volume. The assembled information will assist gardeners and farmers, nurserymen and foresters, homeowners and householders in more effective control of such destructive animals as rabbits, woodchucks, squirrels, moles, bats, opossums, rats, mice, as well as foxes, bears, coyotes, bobcats and mountain lions. A brief life history and description of each animal is included as well as the animal's relationship to man, and the damage it can do. Control measures for each type are given in detail. Dr. Eadie is Associate Professor of Zoology, Conservation Department, Cornell University.

Introduction to Vertebrate Embryology. W. SHUMWAY and F. B. ADAMSTONE. 398 pages, 256 illustrations. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (Fifth edition, 1954) $6.00.

This is the fifth edition of a textbook that has been a standard in many schools for over two decades. The book has retained its broad factual approach to the subject although considerable physiology and experimental embryology have been included. The illustrations have been extensively revised to insure more uniformity.

The Western End of Lake Erie and Its Ecology. THOMAS H. LANGLOIS. 479 pages, illustrations. J. W. Edwards, Publisher, Ann Arbor, Michigan. (1954) $10.00.

Dr. Langlois has been Director of the Franz Theodore Stone Institute of Hydrobiology at the University of Ohio since 1936 and this book summarizes his studies of sixty years in this particular area of Lake Erie. He points out "that the shallow western part of Lake Erie, into which certain influential streams discharge their waters, and into which most of the shoal-seeking fishes make their spawning migrations, appears to be the "key area" for starting the conversion process which culminates in the crops of fish." Since "no other such large body of water has had any comparable long-term research program," the information presented here should prove extremely useful to hydrobiologists elsewhere who are dealing with similar ecological situations. The author discusses, in considerable detail, the physical environment, its relationship to the organisms, the biota (by phylum, class and order), and the fisheries and fish management problems.

Those of the Forest. WALLACE B. GRANGE. 314 pages, line drawings. Flambeau Publishing Company, Babcock, Wisconsin. (1953) $4.75.

Those of the Forest is neither a textbook nor a scientific treatise. It is a story with a plot that nature planned and in which a snowshoe rabbit stars. It is written by a professional naturalist and illustrated by another. All of the experience and observation of years spent in the wilderness are woven into this verbal reproduction of the passing of the seasons in a forest and the lives of the animals that inhabit it. Since Mr. Grange is an ecologist and game superintendent by profession, the mark of scientific authority colors his remarks but never discolors the word pictures he paints. Olaus J. Murie's pen and ink sketches add considerably to the appearance of the book and indicate, through a different medium, that another person who is appreciative of wildlife, has contributed to the volume. This particular blend of ecology, imagination, philosophy and poetic prose is an unusual combination to encounter.

Classification of Insects. C. T. BRUES, A. L. MELANDER and F. M. CARPENTER. 917 pages. Vol. 108, Bulletin of the Museum of Comparative Zoology, Harvard University, Cambridge, Mass. (Second edition, 1954) $9.00.

This rotund volume, with 245 pages and 105 figures more than the first edition, reflects the steady growth of systematic entomology during the past two decades. In several orders the system of classification differs scarcely at all from that presented before. In others very extensive revision of keys has been made to conform with newer concepts. A new section, dealing with the extinct families of insects, has been included in the revised edition and reflects the distinct advance that has been made in insect paleontology. The keys to the families of the Lepidoptera have been entirely redone by C. L. Remington of Yale. The American Philosophical Society supported the preparation of this revision.

Marine Tropicals. ED L. FISHER. 56 pages, illustrated. Sub-Marine Studios, 918 Langford Building, Miami, Florida. (1954) $1.50.

The author, a professional diver, offers in this small booklet pertinent information about maintaining marine fish and salt-water aquaria. He is able to draw on his lengthy experience of hunting and observing marine life in its natural habitat and includes anecdotes about the fish and invertebrates encountered. A list of species easiest to keep in captivity is appended.

Order Isoptera, The Termites of the United States and Canada. THOMAS E. SNYDER. 64 pages, 27 figures. National Pest Control Association, 30 Church Street, New York 7, N. Y. (1954) $2.00.

This "technical bulletin" was prepared primarily for pest control operators to enable them to identify any species of termite they might encounter in their work. Written by Thomas E. Snyder, retired termite specialist of the U. S. Department of Agriculture and an international authority on the biology and control of these important insect pests of wooden structures, the book contains a key to the 41 species found in the United States and Canada, with definitions of technical terms; the distribution of these species by states and provinces; and a description of each species, with information on its habits and economic importance. The excellent line drawings illustrate, as a rule, the head and prothorax of soldiers or the body and wings of adults. This authoritative introduction to termites should be in the hands of everyone who needs to know something more than the difference between termites and ants.

Fishes Found in the Fresh Waters of Texas. FRANK T. KNAPP. 166 pages, line drawings. Ragland Studio and Litho Printing Company, Brunswick, Georgia. (1953) $2.00.

The author is Chief of the Research Unit of the Georgia Game and Fish Commission and formerly Assistant Professor of Fisheries at the A & M College of Texas. This book was written to assist in the conservation education of Texas youth and to supply a popular handbook for sport fishermen. 16 orders, 40 families, 94 genera and 190 species are included. 190 line drawings indicate the salient distinguishing features of the various species. Dr. Knapp defines fresh water as that under 2 parts per thousand salt and lists only those species found in such water. The keys used have been tested for several years by faculty and students at Texas A & M. A glossary and reference list are useful terminal additions.

Systema Helminthum. Part I. Digenetic Trematodes of Fishes. SATYU YAMAGUTI. 405 pages, 422 figures. Published by Japan Society for the Promotion of Science, Tokyo, Japan. Obtainable from the author, Animal Disease and Parasite Research Branch, Zoological Division, USDA, Beltsville, Maryland. (1953) $6.50.

The author, who is Professor of Parasitology at the Okayama University Medical School, Okayama, Japan, has written a concise account of the digenetic trematodes that use fish as hosts. He believes it practical, in view of the very variable morphological and biological characteristics that exist among trematodes, to "divide them first according to the primary divisions of their host animals and then on the basis of their developmental and morphological characters." The material presented is world-wide and Dr. Yamaguti expresses, himself, the probable need for a revision in the near future when easier access to more complete bibliographic material will supply additional species for inclusion. Meantime the present edition will serve as a taxonomic guide and useful handbook to all parasitologists working with trematodes.

Illustrated Keys to the Adult Culicine Mosquitoes of America North of Mexico. SATYU YAMAGUTI. 48 pages plus 149 plates. Published by the author. Obtainable from same at Animal Disease and Parasite Research Branch, Zoological Division, Beltsville, Maryland. (1952) $10.50.

A handbook for the identification of mosquitoes of America north of Mexico, this paper-bound treatise contains general biological and morphological characters of genera as well as illustrated keys to both genera and species. The illustrations are the outstanding feature of the book. They were reproduced by the Japanese collotype printing process and appear, page after page, with the concise quality of etchings.

PLANT SCIENCES

The Trees and Shrubs of the Southwestern Deserts. LYMAN BENSON and ROBERT A. DARROW. 437 pages, 84 figures and 34 plates. University of New Mexico Press, Albuquerque, New Mexico. (Second edition, 1954) $8.50.

This is a revision of a work first published in 1945 by the University of Arizona under title of "A Manual of Southwestern Desert Trees and Shrubs." One of a series on the flora of Arizona and the southwest it is designed as a semi-technical manual for identification of the woody plants of the southwestern United States. Introductory remarks and an exposition of general taxonomic principles comprise the first forty-four pages. Keys to and descriptions of forty-three families of woody plants represented in the southwestern flora make up the bulk of the text. Particular mention should be made of the colored photographs and of the handsome line drawings by Lucretia Breazeale Hamilton.

A Monograph of the Fungus Genus Cercospora. CHARLES CHUPP. 677 pages, 222 line drawings. Published by the author, Plant Pathology Department, Cornell University, Ithaca, N. Y. (1953) $10.00.

The author attempts, in this large and well-organized monograph, to list, on a world-wide basis, the species of the genus *Cercospora*. The original description, synonyms, revised descriptions, types, hosts, geographic distribution, and author's discussion are included for each species. In instances where host genera have more than two Cercosporae, keys for the separation of the fungus species are given. The work is based, insofar as possible, on a study of the types represented in the larger herbaria of Europe and the United States and specimens sent to the author by mycologists of other countries.

Classification of Wheat Varieties Grown in the United States in 1949. B. B. BAYLES and J. A. CLARK. 173 pages, paper bound. Technical Bulletin No. 1083. U. S. Department of Agriculture. For sale by Superintendent of Documents, Washington 25, D. C. (1954) $.70.

Illustrated with photographs and distribution maps, this publication of the Department of Agriculture covers all varieties of wheat grown in the U. S. in 1949. Keys to the different varieties are included and a bibliography appended for the use of anyone desiring further details.

Principles of General Ecology. ANGUS M. WOODBURY. 503 pages, 167 illustrations. The Blakiston Company, Inc., 575 Madison Avenue, New York 22, N. Y. (1954) $6.00.

This is a college text in general ecology designed specifically for a one-semester course with prerequisites of general biology, general botany, and general zoology. It may be condensed for use in one-quarter courses and, with suitable supplementary material, expanded for a two-quarter course. After a brief introductory portion concerned with general ecological considerations the text material is divided into a section on physical environment and a section on biotic relationships. Photographs, charts and graphs are generally excellent. A useful bibliography is included. There is no glossary but each term is italicized when it first appears in the text.

Abnormal and Pathological Plant Growth. Brookhaven Symposia in Biology #6. 303 pages, illustrated. Biology Department, Brookhaven National Laboratory, Upton, N. Y. (1954) $2.10.

The 15 papers presented at the sixth annual symposium held under sponsorship of the Brookhaven National Laboratory are included in this book. The purpose of the symposium was to bring together representatives from all major fields of investigation concerned with abnormal growths in plants. A transcript of the discussion following each paper is included as well as a list of participants and a complete index arranged by author and subject. This book is now available from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

Basic Botany. FRED W. EMERSON. 425 pages, illustrated. The Blakiston Company, 575 Madison Avenue, New York 22, N. Y. (Second edition, 1954) $5.00.

First published in 1947, this is a revision of a popular general botany text. The basic approach of the first edition is retained but additional material on historical development of both equipment and ideas has been incorporated in the text. For the student who wishes to expand the subject matter of the text there is a short list of selected readings following each chapter and a fairly inclusive list of general references at the end of the book. Professor Emerson has attempted to place greater stress on the practical applications of plant science to farm and garden problems.

Vegetable and Tanning Materials. F. N. HOWES. 325 pages, illustrated. Butterworth's Publications, Limited, London. American Distributors: The Chronica Botanica Company, 977 Main Street, Waltham 54, Massachusetts. (1953) $5.50.

Chronica Botanica has acquired American rights for this title, which is a companion volume to Dr. Howes' "Vegetable Gums and Resins." Recently developed techniques in the employment of different kinds of vegetable tanning materials in the leather and tanning industries are described. This survey of plants throughout the world, known to be rich in tannins, deals altogether with some 300 species. In addition there is included a list of miscellaneous tanning materials, an extensive list of references, an index of plant names and a general index.

The Ferns and Fern Allies of New Mexico. HOWARD J. DITTMER, EDWARD F. CASTETTER, and ORA M. CLARK. 139 pages, 55 figures. The University of New Mexico Press, Albuquerque, New Mexico. (1954) $1.00.

This little manual should be a valuable addition to the library of anyone interested in the flora of the southwest. Listed in the manual are 7 families, 24 genera, and 75 species and varieties of ferns and fern allies. Each species is described fully and many are illustrated by full page plates of line drawings by Jeanne R. Janish.

Check List of Native and Naturalized Trees of the United States (Including Alaska). ELBERT L. LITTLE, JR. Agriculture Handbook #41, United States Forest Service, Washington, D. C. (1953) $2.00.

Obviously this book will be of primary value as a reference for foresters and botanists. Since this work now becomes the official standard for nomenclature in the Forest Service, it should encourage uniform usage of names for trees generally. Over 1000 native species, varieties and hybrids are arranged in 252 genera of 77 families. Included also are some 78 species of naturalized trees. The taxonomic treatment basically is conservative. Available only from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

MISCELLANEOUS

The Structure and Reactions of the Aromatic Compounds. G. M. BADGER. 456 pages, illustrated with tables and structural formula. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. (1954) $11.50.

Since about one-third of all known organic compounds are aromatic, this book should be of interest to a large group of scientists. It is addressed primarily to post-graduate and senior university students, but research chemists in the dyestuffs, pharmaceutical and explosives industries are also likely to find it useful. Some selection of material has been made by the author, although the whole field of aromatic chemistry has been covered. Some of the less important substitution reactions have been neglected entirely, and synthetic methods have not been discussed unless they happen also to be substitution or addition reactions directly involving an aromatic ring system. Dr. Badger is Reader in Chemistry at the University of Adelaide.

Methods of Biochemical Analysis. Volume I. Edited by DAVID GLICK. 521 pages. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. (1954) $9.50.

Annual review volumes now occupy an important place in the field of scientific publications. Up to the present time these reviews have been concerned primarily with the results of research in various fields and have served to keep the investigator, teacher and student within sight of the current status of knowledge in a particular area. Experimental methods, innovations and techniques have not received similar attention and this volume represents the first in a series designed to meet this need in the field of biochemical analysis. The topics to be included "are chemical, physical, microbiological and, if necessary, animal assays, as well as basic techniques and instrumentation for the determination of enzymes, vitamins, hormones, lipids, carbohydrates, proteins and their products, minerals, antimetabolites, etc." David Glick, Professor of Physiological Chemistry at the University of Minnesota, is editor of the series.

Dynamics of Growth Processes. Edited by EDGAR J. BOELL. 304 pages. Princeton University Press, Princeton, New Jersey. (1954) $7.50.

For eleven years the Society for the Study of Development and Growth has sponsored an annual Growth Symposium. The collected symposium papers, in the past, have appeared as supplements to the journal *Growth*. The papers of the Eleventh Symposium, held at Williams College in June 1952, have been published now in book form for the first time. The aim of these symposia has been to "provide an opportunity for serious students and research workers, in various biological and related disciplines, to consider together certain fundamental aspects of normal and abnormal growth and development." Contributors to the Eleventh Growth Symposium were: L. M. Kozloff, A. Novick and L. Szilard, A. W. Pollister, G. Fankhauser, K. R. Porter, D. S. Van Fleet, F. W. Went, F. Skoog, R. Gaunt, W. W. Greulich, D. A. Sholl, G. E. Dickerson and F. E. Smith.

The Biochemistry of Genetics. J. B. S. HALDANE. 144 pages. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (1954) $2.75.

The author states in his preface, "This book is emphatically not a textbook." The contents are based on lectures given in the Department of Biochemistry, University College, London, in 1950 and 1951 and, according to the publishers, this is the only book on the subject in any language. Chapter headings are: The Elements of Genetics; Possible Primary Products of Gene Action; Genes Controlling Synthesis in Fungi; Biochemical Genetics of Yeast, Bacteria and Viruses; Biochemical Genetics of Higher Plants; Biochemical Genetics of Higher Animals, Including Man; Extranuclear Influences on Biochemical Activity, Including Training; Mutation, and the Problem of Gene Reproduction; and Tentative Conclusions. Although some geneticists may not agree with all of Professor Haldane's conclusions, he does write about an interesting subject in an interesting fashion.

Microbes and You. STANLEY E. WEDBERG. 439 pages, illustrated. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (1954) $4.50.

Dr. Wedberg, Associate Professor of Bacteriology at the University of Connecticut, offers in this compact book, material for an introductory survey course in microbiology for students with little or no background in science. It is not recommended for those planning to continue with bacteriological work or medicine. The author writes in his preface: "Because *Microbes and You* is designed for use in a cultural course in science, it is written in a style which should help to hold the interest of the reader." This is true and the wide variety of subject matter covered increases the potential audience.

Histopathologic Technic and Practical Histochemistry. R. D. LILLIE. 501 pages, illustrated. The Blakiston Company, Inc., 575 Madison Avenue, New York 22, N. Y. (Second edition, 1954) $7.50.

Dr. Lillie, who is Medical Director of the U. S. Public Health Service, brings up-to-date his previous publication (1947), *Histopathologic Technic*. The period between editions has been an active one in the field of histochemical research and the author has endeavored to incorporate the best of newer methods. Readers are referred to a general list of 32

books and papers that form the current accumulation of writing in this field. This volume, well organized and subdivided, should prove to be an invaluable addition to any laboratory shelf.

An Introduction to Bacterial Physiology. EVELYN L. OGINSKY and WAYNE W. UMBREIT. 416 pages, 94 figures, 6 line drawings and 18 tables. W. H. Freeman and Company, 549 Market Street, San Francisco, California. (1954) $7.25. ($6.00 text price).

Because the authors believe that physiology is the basis of all knowledge of the bacteria, they have designed this textbook for a course at the undergraduate level, hoping it would bridge the gap which now exists between general bacteriology and the more advanced physiology of graduate courses. Each chapter concludes with a bibliography (including authors' comments) and a group of questions which are "not intended as a review of the chapter, but rather as stimuli for gathering more information." The book is liberally illustrated with clever original line drawings by Evan L. Gillespie and with well-selected electron micrographs. Both authors are at present with the Merck Institute for Therapeutic Research.

Autotrophic Micro-organisms. Edited by J. L. PEEL and B. A. FRY. 305 pages. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. (1954) $5.00.

This volume contains the articles written by contributors to the Fourth Symposium on "Autotrophic Micro-organisms," organized by the Society for General Microbiology in April 1954 in London, England. Contributors are as follows: D. D. Woods and J. Lascelles, The No Man's Land Between the Autotrophic and Heterotrophic Ways of Life; K. A. Bisset and J. B. Grace, The Nature and Relationships of Autotrophic Bacteria; K. Baasrud, Some Aspects of the Physiology of Thiobacilli; J. Meiklejohn, Some Aspects of the Physiology of the Nitrifying Bacteria; G. E. Fogg and M. Wolfe, The Nitrogen Metabolism of the Blue-green Algae; P. J. Syrett, Ammonia and Nitrate Assimilation by Green Algae; H. Gaffron, Mechanism of Photosynthesis; H. Larsen, The Photolithoautotrophic Bacteria and their Energy Relations; S. R. Elsden, The Utilization of Organic Compounds by Photosynthetic Bacteria; L. R. Blinks, The Role of Accessory Pigments in Photosynthesis; E. C. Wassink, Problems in the Mass Cultivation of Photo-autotrophic Micro-organisms; K. R. Butlin and J. R. Postgate, The Economic Importance of Autotrophic Micro-organisms.

The Vitamins. Volume I. Edited by W. H. SEBRELL, JR., and ROBERT S. HARRIS. 676 pages. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. (1954) $16.50.

This is the first volume in a three-volume series planned to provide a comprehensive coverage of the fundamental facts about all vitamins. The second and third volumes are in preparation and due for publication before the end of 1954. Each contributor has been chosen for his competence in a specific field and 66 such experts discuss some aspects of our current knowledge of vitamins. Special emphasis has been placed on chemistry and physiology. Clinical manifestations of vitamin deficiencies and their treatments, methods of vitamin assay, as well as historical material receive only brief mention. However, an extensive bibliography is included for those who wish details in these specific areas.

Advances in Cancer Research. Volume II. Edited by JESSE P. GREENSTEIN and A. HADDOW. 530 pages. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. (1954) $11.00.

The favorable reception accorded Volume I of *Advances in Cancer Research* has been interpreted by the editors as approval of the idea of publishing in book form, authoritative reviews in a particular field of science. Contributors to Volume II are: Peter Alexander, The Reactions of Carcinogens with Macromolecules; G. M. Badger, Chemical Constitution and Carcinogenic Activity; I. Berenblum, Carcinogenesis and Tumor Pathogenesis; A. M. Brues, Ionizing Radiations and Cancer; J. Craigie, Survival and Preservation of Tumors in the Frozen State; L. D. Finninger and G. Burroughs Mider, Energy and Nitrogen Metabolism in Cancer; C. T. Klopp and J. C. Bateman, Some Aspects of the Clinical Use of Nitrogen Mustards; L. W. Law, Genetic Studies in Experimental Cancer; C. Oberling and M. Guerin, The Role of Viruses in the Production of Cancer; C. Chester Stock, Experimental Cancer Chemotherapy.

The Cultivation of Animal and Plant Cells. PHILIP R. WHITE. 239 pages, illustrated. The Ronald Press Company, 15 East 26th Street, New York 10, N. Y. (1954) $6.00.

Dr. White, Research Associate of the Roscoe B. Jackson Memorial Laboratory, claims three objectives for this book; the detailed presentation of all major techniques of cell culture for both plant and animal tissue; the presentation of a group of simple techniques that should arouse the interest of biologists engaged in other work; and the emphasis that the cell itself warrants in all physiological problems. As a physiologist, rather than an anatomist, the author considers the developmental patterns of the individual cells of greater interest than the establishment of stable strains. His extensive familiarity with both plant and animal tissues allows the discussions to cross into both kingdoms and his suggestions for suitable material in the solution of a particular problem draw on both materials. This book cannot be considered a survey of the subject and perhaps because of this makes very interesting reading.

The Chemistry of the Morphine Alkaloids. K. W. BENTLEY. 433 pages. Oxford University Press, 114 Fifth Avenue, New York 11, N. Y. (1954) $8.00.

This work is the first of a planned series of monographs on the Chemistry of Natural Products (General Editor: Sir Robert Robinson) in which emphasis will be placed on a complete account of investigations bearing on molecular structure by chemical transformation and synthesis. Morphine, the first of the vegetable bases to be recognized, was only recently synthesized (1952). One book over 20 years old and scattered chapters in general texts on alkaloids have been the only sources of information about these compounds to date. This large and detailed volume should find a ready audience. Dr. Bentley is Lecturer in Chemistry at the University of Aberdeen.

Subject Heading Authority List Used by the Current List Division, Armed Forces Medical Library. SEYMOUR I. TAINE, Editor. 267 pages. Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. (1954) $1.75.

The Subject Heading Authority List is the result of several years study of subject heading theory and practice. This project was undertaken by the Armed Forces Medical Library in Washington and its Medical Indexing project conducted at Welch Memorial Library, Johns Hopkins University. The *List* totals about 12,000 subject headings and complete cross references.

The Microtomist's Formulary and Guide. PETER GRAY. 794 pages, illustrated. The Blakiston Company, 575 Madison Avenue, New York 22, N. Y. (1954) $10.50.

In his preface the author warns his readers that they may become incensed at what they take to be "inaccuracies, errors, and faulty arrangements." Perhaps but the laboratory biologist concerned with the preparation of objects for microscopic examination will find this to be an invaluable manual to have at hand. The work consists of two parts. The first sixteen chapters have to do with what Dr. Gray calls "the art of making laboratory slides." A classified list of the

formulas and techniques used in the laboratory comprises Part II (Chapters 17-28). Although primarily a reference, the well-written and interesting exposition of laboratory techniques will convince many instructors of microtechnique courses that this book is quite suitable for a text.

Physical and Chemical Aspects of Basic Mechanisms in Radiobiology. Edited by J. L. MAGEE, M. D. KAMEN and R. L. PLATZMAN. 145 pages. Publication 305 of the National Academy of Science-National Research Council, 2101 Constitution Avenue, Washington 25, D. C. (1953) $1.00.

This volume was prepared from the transcript of an informal conference held in Highland Park, Illinois, May 7-9, 1953, and sponsored by the Subcommittee on Radiobiology of the Committee on Nuclear Science (NRC). The conference brought together physicists, chemists and biologists to discuss the interaction of radiation and biological systems in its basic aspects. The participants speculated freely and subjected their ideas to the test of group analysis. The editors write in the preface, "It is our hope that the reader of this volume may be able to gain some insight into the ways in which at least a small group of scientists are thinking about current problems in the basic physical and chemical phenomena responsible for radiobiological effects."

Diagnosis and Improvement of Saline and Alkali Soils. L. A. RICHARDS, Editor. 160 pages, illustrated. Agriculture Handbook #60, U. S. Department of Agriculture. Available from Superintendent of Public Documents, U. S. Government Printing Office, Washington, D. C. (1954) $2.00.

This handbook is the product of the combined efforts of the entire staff of the U. S. Salinity Laboratory at Riverside, California. It is intended as a practical guide to those confronted with soil, plant and water problems involving salinity and alkali. The first five chapters provide a basis for the interpretation of measurements of saline and alkali soils. Chapters 6, 7 and 8 describe procedures and measuring methods which the Laboratory has found to have general applicability in the diagnosis and improvement of alkali and saline soils.

The Present State of Physics. Edited by FREDERICK S. BRACKETT. 265 pages. American Association for the Advancement of Sciences, 1515 Massachusetts Avenue, Washington 5, D. C. (1954) $6.75 ($5.75 to members of AAAS).

This collection of papers contains several that will be of interest to biologists. The section on Chemical Physics features two papers: "The Structure of Polymers" by P. J. W. Debye and "Implications of the Chemical Kinetics of Some Biological Systems" by Rufus Lumry and H. Eyring. A concluding section on Biophysics features: "Some Physical and Chemical Properties of Axons Related to Conduction of Nerve Impulses" by Frank Brink, Jr., and "Bioluminescence and the Theory of Reaction Rate Control in Living Systems" by Frank H. Johnson. Other areas of present-day physics which are featured in the volume are Elementary Particles and Physics of the Solid State. One of the authors point out, in speaking about biophysics, it "is still in its infancy . . . growing rapidly . . . and one may look forward with confidence that biophysics will bring results equally spectacular (as nuclear physics) and of no less consequence to mankind."

Silage Fermentation. A. J. G. BARNETT. 208 pages. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. (1954) $5.00.

Little published material in book form exists on this subject. It is handled here in both a practical and scientific manner, with emphasis on the latter. Because the practical aspects cannot be omitted in a survey of silage problems, a general description of the main types of silos and of the varying methods of making silage, particularly as these variations influence the nature of the changes, are included. In the sections dealing with analysis, older and traditional methods are described as well as more modern ones. Where new methods are under development at research centers, the research involved is discussed. The author continues to point out how little is really known about the complex biochemical processes that occur during ensilage and how badly further research is needed in this area of growing importance. Dr. Barnett is Lecturer in Agricultural Biochemistry at the University of Aberdeen.

Radiation Biology. Volume I. High Energy Radiations. Part I and II. Edited by ALEXANDER HOLLAENDER. 1265 pages, illustrated. McGraw-Hill Book Company, 330 West 42nd Street, New York 36, N. Y. (1954) $17.50.

A handsome set in two parts, Volume I, dealing with high energy radiations, is the first of a three-volume work of reference prepared under the sponsorship of the National Research Council and the editorship of Dr. A. Hollaender. The complete series will deal with the biological effects of radiations, corpuscular and electromagnetic, throughout the energy spectrum from the highest available energies to the near-infrared region. Volume II, in press, will discuss ultraviolet radiations, but since many biological effects are common to both ionizing and ultraviolet radiation, Volumes I and II may be regarded as a whole. Volume III, in preparation, will deal with visible light. Studies on the use of radioisotopes as a research tool are not included because adequate texts are already available. Over fifty of the leading biologists, biophysicists, and medical scientists of the country have contributed to this outstanding series.

The Historical Roots of Learning Theory. HORACE B. ENGLISH. 21 pages. Doubleday and Company, Inc., 575 Madison Avenue, New York 22, N. Y. (1954) $.65

This small booklet is one in a series known as the Doubleday Papers in Psychology. Dr. English is Professor of Psychology at Ohio State University. The Consulting Editor of the series, E. L. Hartley, writes in the preface: "This paper by Horace English undertakes a review of the historical roots of contemporary learning theory . . . . . it helps the reader appreciate the way in which scientific progress is built on prior findings, and the way in which scientists, as human beings, necessarily are influenced in their thinking by the general conditions and the prevailing philosophies of the times during which they live and work."

Man in Society. GEORGE SIMPSON. 90 pages. Doubleday and Company, Inc., 575 Madison Avenue, New York 22, N. Y. (1954) $.95

"Man in Society," by Professor Simpson of Brooklyn College, initiates the Doubleday Short Studies in Sociology. Each Study will "treat systematically and with concrete illustrations a particular phase of sociology and may be used to supplement or to replace standard textbook assignments." Throughout the book, the author draws attention to the scientific aspirations of sociology and to the responsibilities that science imposes on its adherents. For these reasons the contents of this small volume should be of interest to many scientists.

Social Planning in America. JOSEPH S. HIMES. 59 pages. Doubleday and Company, 575 Madison Avenue, New York 22, N. Y. (1954) $.95.

Another in the Doubleday Short Studies in Sociology, this small volume will be of interest to the biologists who are interested or involved in "planning." Professor Hines, who teaches sociology at the University of North Carolina, analyzes the nature, methods and problems of social planning, especially on the community level, while keeping in focus the changing features of the American social system. It is a practical book, written primarily for the student and the lay reader.

The Natural Man. CLARENCE LEUBA. 70 pages. Doubleday and Company, Inc., 575 Madison Avenue, New York 22, N. Y. (1954) $.95.

Another contribution to the Doubleday Papers in Psychology, "The Natural Man, as Inferred Mainly from Field Studies of Men and Chimpanzees," is written by the Chairman of the Department of Psychology of Antioch College. To answer the question "What is the essential nature of man?" Professor Leuba has summarized the findings of scientific research in such areas as: the systematic observations of chimpanzees in the field and in controlled breeding and laboratory centers; the reports on children seemingly raised by animals, who subsequently came under human scrutiny; and the reports of anthropologists who have studied primitive (nonliterate) cultures throughout the world. These three lines of evidence are only suggestive and the author makes a plea for direct experimentation, pointing up the continued need of interdisciplinary, or rather multidisciplinary, thinking in undertaking a single significant problem.

LABORATORY MANUALS

A Laboratory Manual of Vertebrate Embryology. F. B. ADAMSTONE and WALDO SHUMWAY. 98 pages, illustrated. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1954) $2.50.

Part I. Anatomy of frog embryos.
Part II. Anatomy of chick embryos.
Part III. Anatomy of the 10 mm. pig.

Private Bibliographies

Continued from April *Bulletin*

ANIMAL SCIENCES

91. LIMB ANATOMY AND DEVELOPMENT. James M. Moulton, Dept. of Biology, Bowdoin College, Brunswick, Maine. Period: 1874 to date. Approx. 500 references. Selective. Not geographically limited. Partially annotated. May be seen.

92. AMPHIBIANS. Clyde F. Reed and Jay Allen Collars, 10105 Harford Road, Baltimore 34, Maryland. Period: 1800 to date. Approx. 2,000 references. Inclusive: selective for Plethodonts. Not geographically limited. Unannotated. May be seen.

93. TICKS IN RELATION TO ANIMAL AND HUMAN DISEASE. Cornelius B. Philip, Rocky Mountain Laboratory, USPHS, Hamilton, Montana. Period: complete to 1940, partial thereafter. Approx. 2200 references. Inclusive. Not geographically limited. Annotated. May be seen.

94. AMERICAN LOBSTER. Ralph W. Dexter, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn. Period: 1800-1946. Approx. 500 references. Inclusive. Not geographically limited. Unannotated. May be seen.

95. MARINE MAMMALS. Ford Wilke, U.S. Fish and Wildlife Service, 2725 Montlake Blvd., Seattle 2, Washington. Period: to date. Approx. 6,000 references. North America geographically emphasized. Unannotated. May be seen.

PLANT SCIENCES

54. BOTANY (ECOLOGY & PHYTOGEOGRAPHY) AND ANTHROPOLOGY. Theodore P. Bank, II, Dept. of Botany, University of Michigan, Ann Arbor, Michigan. Period: 1741 to date. Approx. 1,500 references. Inclusive. Limited to western American Arctic and Subarctic. Partially annotated. May be seen.

55. MALEIC HYDRAZIDE—PLANT GROWTH INHIBITOR. John W. Zukel, U. S. Rubber Company, Bethany, Connecticut. Period: 1947 to date. Approx. 250 references. Inclusive. Not geographically limited. Annotated. Printed summaries available upon request.

56. LAKE MISTASSINI DISTRICT (NATURAL HISTORY, GEOGRAPHY, HISTORY, ETHNOLOGY, ETC.). Jacques Rousseau, Montreal Botanical Garden, 4101 Sherbrooke Street, East, Montreal, Quebec, Canada. Period. 1650 to date. Approx. 500 references. Inclusive. Geographically limited. Will probably be published.

57. SEEDS (GERMINATION, DORMANCY, PRODUCTION, STORAGE, ETC.). Eben H. Toole and Vivian Kearns Toole, Plant Industry Station, Beltsville, Md. Period: to date. Approx. 10,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

58. BLUEBERRIES. William W. Smith, Horticulture Department, University of New Hampshire, Durham, N. H. Period: to date. Approx. 600 references. Inclusive. Not geographically limited. Unannotated. May be seen after May 1, 1954.

59. THE COTTON PLANT (Seedling diseases of). C. H. Arndt, Botany Department, Clemson College, Clemson, South Carolina. Period: 1930 to date. Approx. 2,000 references. Not geographically limited. Partially annotated. May be seen.

60. BIOLOGY OF STELLARAI MEDIA (CARYOPHYLLACEAE). L. J. King, Boyce Thompson Institute for Plant Research, Inc., 1086 North Broadway, Yonkers 3, N. Y. Period: to date. Approx. 450 references. Inclusive except for local distributional records. Not geographically limited. Annotated. May be seen.

61. HONEY PLANTS. Harvey B. Lovell, Biology Department, University of Louisville, Louisville, Kentucky. Period: 1870 to date. Approx. 800 references. Inclusive. Chiefly North America. Extensively annotated. May be seen.

62. MISTLETOES (LORANTHACEAE). Frank G. Hawksworth, Forest Insect and Disease Laboratory, Box 523, Albuquerque, New Mexico. Period: to date. Approx. 2,000 references. Inclusive. Not geographically limited. Two-thirds annotated. May be seen.

63. EASTERN ASIATIC BOTANY. Egbert H. Walker, Department of Botany, Smithsonian Institution, Washington 25, D. C. Period: 1937 to date. (Supplements "Bibliography of Eastern Asiatic Botany," by E. D. Merrill and E. H. Walker (1938).) Approx. 4500 references (previous bibliography, 21,000). Inclusive. Geographically limited to China, Japan, Formosa, Korea, Manchuria, Mongolia, Tibet, eastern Siberia, Far East. Annotated. May be seen.

64. ECOLOGY OF RIVER ALGAE. John L. Blum, Canisius College, Buffalo 8, N. Y. Period: approx. 1850 to date. Approx. 700 references. Inclusive. Not geographically limited. Largely annotated. May be seen.

65. CYTOTAXONOMY OF PLANTS. Askell Löve, Department of Botany, University of Manitoba, Winnipeg, Canada. Period: to date. Approx. 10,000 references. Inclusive. Not geographically limited. Unannotated. May be seen.

66. THE DOWNY MILDEWS (PERONOSPORACEAE). Charles Garner Shaw, Department of Plant Pathology, State College of Washington, Pullman, Washington. Period: 1796 to date. Approx. 2100 references. Inclusive. Not geographically limited. Annotated. May be seen.

67. DUCKWEEDS (LEMNACEAE). Albert Saeger, University of Kansas City, 5100 Rockhill Road, Kansas City 10, Mo. Period: 1763 to date. Approx. 275 references. Inclusive. Not geographically limited. Annotated. May be seen.

68. ALGAE OF CANADA. Jules Brunel, Institut botanique, Universite de Montreal, 4101 est, rue Sherbrooke, Montreal 36, Canada. Period: to date. Approx. 6,000 references. Inclusive. Geographically limited to Canada. Unannotated. May be seen.

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American Documentation Institute

AN organization of considerable interest and importance to all scientists is the American Documentation Institute. Despite a life-span of 17 years it is still relatively unknown to most of the men and women who would find its services invaluable. That the 15,000 biologists who read the *AIBS Bulletin* may be introduced to the ADI and learn of the services offered, this brief description appears.

The Institute has undertaken a wide variety of activities since its organization in 1937. One of the initial objectives was the development of microfilm. To this the Institute gave its earliest attention and contributed a number of important and pioneer developments. It established the Bibliofilm Service, which offered the first general microfilm service that made use of the rich collections of the Federal libraries in Washington. To assist users in utilizing the microfilm, the ADI promoted the development of a moderately priced microfilm reader. One of the early problems that arose over microfilming material from research journals involved the copyrights that many of the publications held. The Institute fostered discussions and research that resulted in the so-called Gentleman's Agreement covering the photoduplication of such copyrighted material.

At the beginning of 1953 an agreement was reached whereby the microfilming would be done by the Library of Congress. By that date a list of some 39 serials had accumulated, totaling over 128,000 feet of negative microfilm. Inquiries about this microfilm service should be addressed to: Chief, Photoduplication Service, Library of Congress, Washington 25, D. C.

Another outstanding program that was established when the Institute was founded, was the Auxiliary Publication Service. This was designed to provide relief to overcrowded scientific journals and make available detailed documentary material that might not otherwise have been published. Instead of publishing the full text of an article, the journal editor publishes an abbreviated paper, with a note saying that the full text or additional material is available in microfilm at a moderate price from the ADI. In this way expensive journal space is saved and specialized material, in complete form, made available to the small number of scientists who are especially interested in it. The Institute undertakes to provide copies of these papers in perpetuity. The system has also proven useful for making available expensive tabular and appendectical matter, which cannot be included in the average article because of journal restrictions. The Auxiliary Publication Service is now handled, as is the Microfilm, through the Photoduplication Service of the Library of Congress.

The interests of the Institute are by no means confined to the techniques of microfacsimile, although the possibilities in that area have not been exhausted. The program of the Institute encompasses the entire range of documentation problems—the creation of recorded knowledge . . . its publication . . . its dissemination . . . its storage . . . its classification and its use. Since problems in each of these areas are of vital concern to all scientists the Institute undertakes research and the dissemination of information about advances in both specific and general subjects.

One time-consuming part of all research is literature searching. The Institute has concerned itself with all new means of mechanized searching. Closely allied to the search itself are methods of indexing and abstracting and the problems of storing knowledge in its present form. The ADI maintains close contact with all persons and organizations attempting to devise better indexing and abstracting systems and those who are developing more compact methods of storing literature.

Occasionally a bottleneck occurs in a research project over the inability to obtain, quickly, necessary bibliographic references. Interlibrary loans were the initial attempt to alleviate this situation. With the advent of microfilm reproduction, the necessary material could be duplicated and forwarded within a relatively short time. The most recent attempt to speed up this exchange process has utilized telefacsimile and television. Through either of these media copies of the required literature may be received within minutes or hours from the time it is requested. Development in these new areas is costly and still in its infancy, but considerable progress has been made.

Closely allied to better and faster methods of obtaining copies of necessary literature, are mechanized methods of translating foreign papers. A machine, announced recently in the local press, that translates Russian (within limits), indicates the extent to which development in this area has proceeded.

Problems in printing and reproducing are always under consideration by the Institute, and new and inexpensive methods are checked and fostered. The intellectual problems of classifying knowledge are often neglected but the ADI has maintained an interest and been a source of encouragement in this area.

All ways, philosophical, psychological and mechanical, by which recorded knowledge is transmitted from one individual to another in time and space, are the concern of the Institute. Inquiries, ideas and suggestions are welcomed and given careful consideration.

Until recently the membership of the Institute was limited to a relatively small group composed of individuals nominated by sixty-eight scientific, learned, and professional societies, foundations and government agencies. However, as interest in the many fields of documentation grew and more and more individuals took an active part in the development of new principles and techniques, the inadequacy of ADI's membership structure became apparent. Consequently, in March 1952, the by-laws were amended to admit individual and institutional members. Membership now includes three types of members, each paying dues, and each entitled to one vote in all meetings: Individual members—$10 per year; Institutional members (represented by delegate)—$50 per year; Nominating agency members—$10 per year. Elected by and deriving its power from the entire membership body, the administration of the Institute is in the hands of the Council, which consists of the president, president-elect, past-president, treasurer, and two councilors. The secretary is appointed by the Council. All officers serve for one year. The professional interests of the Institute are delegated to the several committees, which change as interests and developments change.

The ADI is the United States member of the Federation Internationale de Documentation, and as such is playing a major role in the current reorganization of that body. At least two of the ADI's officers also serve in an official capacity in the FID.

It was decided in 1950 that the Institute should establish a journal, *American Documentation*, to serve as the forum for the publication of articles of interest to documentation. It also serves as the official news organ of Institute affairs and is received by each member as part of his membership privileges. All communications with the Institute should be addressed to: Secretary, American Documentation Institute, c/o Library of Congress, Washington 25, D. C.

Biology for the General Reader

GERARD PIEL

Publisher, SCIENTIFIC AMERICAN

HAPPILY, there is no need to urge in these pages the importance of the popularization of science. The A.I.B.S. itself constitutes one of our most significant enterprises in this field. It was set up, after all, to popularize biology among specialists in the biological sciences. Such a goal would seem no less desirable than the education of the public at large. On further consideration, it will be seen that both undertakings share many other aspects in common.

Biology has been spared—or has missed—the intense interest and concern that the public has focused on physics over the past decade. This isolation is not due to last much longer. The life sciences touch human existence at many more points and in more intimate ways than physics ever will, no matter how low the price of a kilowatt hour is brought by nuclear reactors. Recent and near future advances in man's understanding and control of life processes will raise moral issues far more profound and pervasive than those posed by the vaporization of Pacific atolls.

There are positive compulsions, too, for a better understanding of biology by biologists and their fellow citizens. Biology does not only offer means to manipulate life—to control, for example, the quality as well as the number of the human population. It provides some of the major grounds for the value judgments that men must make in exercising such control. Biology has bearing on ends as well as means.

This brings us to the primary distinction between an article written for the general reader and the formal paper addressed to scientific colleagues. When a specialist in any one of the diversely differentiated biological sciences sits down to write about his work for the general reader, he must do so as a biologist and take biology for his subject. He will be concerned first and foremost with the meaning of his work, with its relationship to biology as a whole and its significance to human experience.

In many ways, the writing of a formal scientific paper presents an easier task. The author, in the journal of his own field, writes for readers who share a common interest in his subject. Considering that most of them are obliged to read what he has to say, professional colleagues may be classed as a captive audience. They come to the author, furthermore, with a common background of knowledge. He does not have to tell them; they know where his work fits into the scheme of things. They want him to get down to business right away, to give them all the data and a sufficiently detailed description of the experiment so they can repeat it themselves. This leaves little space or time for generalization on what the work means. In fact, such generalization especially in American scientific literature has come to be regarded as an impropriety. As the judges of the work, the author's colleagues claim the evaluation of its significance as their prerogative; they do not want to be told what it means.

One other aspect of technical communication ought to be mentioned, though it is often over-emphasized. Precision requires the use of special verbal symbols which have exact definition, known both to author and reader, but not necessarily to anyone else. Thus it is no wonder that most formal technical writing proves to be incomprehensible to almost everyone except the author's nearest colleagues in his immediate field of specialization. Sometimes even these initiates must come away with the feeling that the author wrote his paper not to increase their knowledge and understanding, but merely to demonstrate the superiority of his own.

In contrast, an article written for the general reader can have only one purpose: to increase the reader's understanding. Here the relationship of the author and the reader is reversed. The general reader is not obliged to listen. It is up to the writer to tune in on his reader, to find the reader's level of understanding and range of interest. The reader does not necessarily share either the scientist's interest in the work or the background of knowledge which gives it meaning.

The general reader has, however, other interests to which the work may be, in fact, must be related. These interests are endless in their diversity and present a vast range of opportunity to relate the reader to the author's work. In the popular press of our country we see demonstrated the more obvious lines of popular interest to which scientific work may be tied. There is, for example, the practical interest of the consumer, confronted today with a half dozen alternatives for the satisfaction of almost every material want and desire. There is the emotionally charged interest of personal health, involved as it is with the motive of survival. There is the sensation and excitement which attends the limitless possibilities of human experience in the boundless universe of science. High on the list also is human interest in human achievement, the dramatization of the scientist as well as his work.

These motives are valid enough in their place; they are appropriate to a good deal of what workers in science have to report to their fellow men. At best, they are effective as means of attracting popular interest. At worst, they contribute to further distortion of the popular idea of science as the modern "House of Magic" and to the miscasting of the scientist as the shaman and bringer forth of wonders. We are told that this is "what people want," and this assertion is usually accompanied by the estimate that the public's intelligence is that "of an eight-year-old." The record shows that this estimate comes close to describing the intelligence and responsibility of entirely too many writers, editors and press agents, but that it falls far short of the true intelligence of the public. In science writing as in other departments of literature, it is the best that endures and ultimately outsells the Grade B productions. Whatever their practical value, the interest motives which are invoked in the science pages of our popular press cannot cover the full range and depth either of public interest or of scientific work.

People are not preoccupied exclusively with the little questions. They are just as often, and more deeply, concerned with the Big Questions which have troubled the inner life of man ever since the human species attained an inner life. The passion for understanding which motivates the work of the scientist is as widely shared among his fellow men as the faculty of consciousness itself. Science moves forward with little jumps, with small accretions to the total body of knowledge. But its progress is motivated at every step by the larger questions in which all men have a stake.

The enduring books and articles which make up the best of the general literature of science—from Thomas Huxley to Julian Huxley in our own times, from Tyndall and Darwin to such first-rate contemporary scientific authors as George

Gaylord Simpson, Greg Walker and Homer Smith—address themselves to this universal interest which all men share in the nature of the physical world and in their own natures. An especially fine example of this straightforward approach to the reader's intelligence is given by Thomas Huxley's "Piece of Chalk." Reversing the now popular method of proceeding from the sublime to the trivial, he leads his readers from the familiar to the farthest reaches of understanding in a half dozen fields of knowledge. The virtue of this approach to the communication of science is that it conveys not only new information to the reader but also a subjective appreciation and understanding the spirit and the method of scientific inquiry, which is more important than any amount of information. Writers who address themselves to the highest interest of their readers do justice not only to their reader but to the work of science.

In brief, it is best to over-estimate the intelligence of the reader and therewith to lift the ceiling and broaden the range of discussion. On the other hand, it is essential that the author should underestimate his reader's prior information about the subject he wants to report. Just as the work must be related to the reader's interest, so it must be related to what the reader already knows. Depending upon the diversity and the size of the audience, the connecting trail must be blazed a longer and longer distance from the center of discussion. Take for example the problem confronting one scientist who recently had new findings to report in his investigation of the chemistry of desoxyribonucleic acid. It was necessary for him, of course, to explain that this material plays an essential role in the function of the chromosomes, to explain further that the chromosomes are found in the nucleus of the cell and further to establish that chromosomes are involved in transmission of hereditary characteristics from generation to generation in the life of all living things. In thus reminding his readers of what they already know about the mechanism of heredity, the author also succeeded in establishing the significance of his work.

Though the author must assume a minimum level of prior information, he need set no upper limit upon the information which the reader can carry away from the article. The reader will be ready to absorb as much new information as will contribute to the increase of his understanding. He will stay with the author in this task so long as the author relates each new unit of information to the central issue with which the article is concerned. The reader wants his facts with relevance.

Turning now to the technical aspects of the subject, the literary compositions of scientists get their lowest marks under the heading of organization. Too often, their articles will be invertebrate recitals of the facts, lacking in structure and synthesis. This may reflect the unfortunate example of the technical paper. But it gives the reader who has the endurance to read the article through an impression that the author himself is not sure what his work means. William Allen Neilson, the late President of Smith College, in his famous Phi Beta Kappa lecture, "The American Scholar Today," before the AAAS in 1937, declared:

> "The ideas most difficult to explain to the layman are often those that are obscure also in the mind of the professional. Even if the attempt is not wholly successful, it is a wholesome and bracing discipline to submit an idea to the test of exposition to the intelligent but ignorant. . . . It can be a powerful agent in clarifying the thought and purifying the style of almost every branch of study."

When the writer really understands what he wants to say, the next step is—briefly and simply—to say it. Having done so, his next step is to relate everything else that he has to say to his major thesis. Like a crystal growing from its nucleus, the subject itself will most often dictate how the evidence and the data are to be built into the structure of the argument. As he proceeds to unfold his subject in this fashion, the author will find the story developing its own plot and generating the same suspense and tension that carries the reader through the works of fiction. He will find also, as Mr. Neilson promised, that he has learned a great deal more about his subject than he knew when he started.

Thus the contention here is that logical and explicit organization of the article is the first essential to giving it clarity and interest. Given a solid structure, the author can next give consideration to the grace notes. There are, for example, no limits to the forms in which a science story may be cast. These will also tend to come naturally. In preparing the reader with the setting and the background of the subject, the author will almost inevitably find himself engaged in an historical narrative. Since it is well known that narration makes for easy reading, this is all to the good. Similary, the story of how the work was done will tend to fall into narrative form. This has the advantage of leading the reader through the same inductive development of evidence that brought the author to his conclusion and thus gives him a subjective sense of the rigor of the scientific method, as distinguished from revelation.

The narrative is a reliable device, but it is not the only way to tell a story. The "Piece of Chalk" suggests another classic form, relating the reader's interest in the near and particular to a new understanding of the distant and general. In an article called "Eye and the Camera," which we had the privilege of publishing in *Scientific American* and which will always be one of our favorites, Professor George Wald, of Harvard University, presented a comprehensive picture of our present understanding of the physics and chemistry of the eye in the form of an elaborate metaphor. He sustained the reader's interest from start to finish because there was, when he was through, no principle involved in photography for which he was unable to demonstrate an analog in the physiology of the eye. Here an entirely obvious metaphor which had been worn out by generations of authors, was successfully carried off by one of the finest writers among American scientists. The best advice, however, is the simpler the better. Most often, the story will really tell itself.

We come finally to the details. The first that occurs, of course, is the troublesome question of vocabulary. It is not nearly so much of a problem as first appears. Insofar as the jargon consists merely in the names of things, the technical term may be easily replaced by familiar, plain English words, perhaps two or three understandable and descriptive words instead of a single unfamiliar one.

It is more difficult to deal with technical terms when they express relationships. But this is only because the relationships themselves are difficult to deal with. We live our lives in terms of one and not more than two variables at a time, and we find that the simple logic of cause and effect gives us a reliable basis for practical day to day decisions. The scientist in his scientific work, by contrast, deals with many variables operating in a state of interdependence with one another. Thus the shorthand word may have to become a paragraph or a chapter in a presentation to the layman, and the presentation may be impossible without the assistance of carefully designed graphic illustration.

The best way to get around this language obstacle, in fact, is to use pictures. The graphic arts, whether photographs, diagrams or tables, can take a good deal of the labor, not to say torture, out of scientific prose. A picture of the unfamiliar thing plainly reduces its mysterious name to the status of a mere label. A diagram of a relationship between two or more variables can reveal their permutations far more explicitly than the most carefully constructed prose. It is so much easier to say "See picture on page 20" and let the artist do the work for the reader as well as the author.

Another important consideration in scientific writing is the range of quantitative experience with which science deals. Mere numbers fail utterly to convey meaning to the layman

in any magnitude exceeding a family bank account on the one hand or a visible fraction of an inch on the other. Here it is best to remember that man is the measure of all things and, with exercise of ingenuity, to find ways of expressing the dimensions of the macrocosm and the microcosm in multiples of human experience with the world in reach of our unaided senses. Because so few readers, including even professional scientists, will recognize 38° C. as equivalent to a fever of 101.4° F., the author will have to concede that a popular article is a poor medium to promote his prejudice in favor of the metric system.

Imagery, vocabulary and style, however, are comparatively minor questions, concerned with the local dimension of the sentence and the paragraph. These will take their place and carry their effect only if the structure of the story is properly designed and followed through. Facts and information will be absorbed only to the extent that the total plan of the article sets up attention, interest and excitement and therewith provides adequate motivation for the intellectual effort which science requires of its readers. There is no literary formula that can take the general literature of science into the field of passive entertainment.

If communication to the general reader is worth this kind of careful effort on the part of the scientific author, the question may well be asked why he should not give the same consideration to his professional readers as well. Perhaps it is not out of order to suggest that the place to begin writing interesting and plainly intelligible science articles is the journals of science.

Social Exotropism

A Disease of Scientists

EARL UBELL

Science Editor, New York Herald Tribune

LOOK, I'm going to talk to you like a Dutch uncle. You are headed for the same fate as the witch-doctor, the cabalist and the Dodo birds. Scientists, in becoming extinct, will mutate by easy stages to super-technicians.

If you don't believe me, read carefully the majority report by *laymen* in the Oppenheimer security risk case. They spell out in detail what a scientist should be: a man with specialized technical knowledge and with enthusiasm. Nothing more. A *public* sense of morality, philosophy and social conscience? —not for the scientist. Let him keep that stuff in his laboratory.

As a former physicist who became infected by the urge to communicate, I look on this state of things with shock. For, if I remember anything from my college days, I recall the earnestness with which my fellow science students talked and talked about life and the whither-are-we-going. We were cultivating that sense of morality, philosophy and social conscience that helped lead us into science in the first place.

But now viewing the scientific scene from a newspaper balcony, I can see that many of my friends are enmeshed in tangles of atoms, antennas and ammunition. They have little time for much else. The broad view of the undergraduate (!) is narrowed down to the microcosm of the specialist.

Specialization will contribute to extinction, but so many have made this point that I won't belabor it again. Two other forces are acting to accomplish the same end: the economic condition of the universities and the silence of the scientists.

With respect to economics, I do not have to remind scientists that the sources of funds for research have decreased considerably recently in relation to the amount of money available. Of the estimated $4 billion spent on research—very little of it pure, mostly applied—fully $3 billion comes from the United States government.

I believe government-supported research is important because among other functions it fills in the gaps in what might otherwise be a lopsided privately supported research program. (Millions for cancer; practically nothing for mental disease.)

Our intuitive desire is to keep Federal intervention at a minimum even under the most ideal circumstances. Tradition in our country teaches us "distrust" of government. The distrust is built into the Bill of Rights and it was voiced countless times by the Founding Fathers. And with good reason.

We have seen only recently how the United States Public Health Service has established essentially political criteria for the granting of funds. We see scientists like J. Robert Oppenheimer and Linus Pauling insulted. We see the compartmentalization of science into secret cabinets. And we see the recklessness of Congressional committees dealing with scholars in universities.

These events will have an effect upon scientists. Lest the scientists believe he can spin a laboratory cocoon about himself and withdraw from this nastiness, let me cite the work of Dr. Barrington Moore, of Harvard, who studied the interrelation of politics and science in the Soviet Union.

Dr. Moore, reporting at the last A.A.A.S. sessions, said that Communist Party intervention into any branch of science immediately depressed, by actual measurement, the rate of publication in that field. Genetics and psychology were cited as examples. He warned that we in the United States should look at the Russian picture and see in it a horrible twisted reflection of the future of science here if political meddling continues.

This might be a spur to some scientists to say to the government agencies: "take back your mink."

However, the universities' economic position makes it difficult if not impossible to disregard the ukases of the Federal Bureaus with respect to certain scientists on their staffs. Rather than maintaining themselves as independent islands of ideas, the universities are fast becoming educational and research arms of government. Some university presidents are invoking the traditions of "patriotism" and "duty" to justify this position. Unfortunately only history will tell us which is the greater patriotism.

Now I come to the nugget of my harangue: the silence of the scientists.

How can our scientific community have kept quiet so long when low-blow after low-blow was delivered to one scientist after another? Why have they not dared move against the wave of anti-intellectualism now drowning out the few brave ones who do speak?

The answer is that it is a symptom of social exotropism (author's invention, pat. applied for). More and more scientists are turning away from society. Some do this in the hope that if they don't interfere with the community the community won't interfere with them. Others are simply retreating from the assault on the "professors" started anew fifteen years ago. And then there are those who act from plain intellectual snobbery.

Scientists must identify themselves and their work with the vast public who are intimately affected by their efforts. Lest this sound Marxian to some ears, let me state that my advice is more practical than dialectical.

When the isolation of the scientific community from society at large is complete, the scientists will be particularly vulnerable. They will represent a minority easily attacked and demolished by demagogues. And the demagogues are already working hard.

The ranters' job will be made easy by the widespread ignorance of the electorate of science, scientists and the scientific tradition. As one who struggles daily to bring the story of science to the public, I know the depth of this ignorance (please do not confuse with lack of intelligence).

Do you know that a survey of high school students showed that the students identified "scientists" as evil. "They do bad things. They want to blow up the world." Do you know that Albert Einstein and perhaps Dr. Oppenheimer are the only two living scientists universally known by name? I could cite other evidence.

I see no broad movement among scientists to make their work known to the public. On the contrary, I see scientists fighting against public disclosure or discussion of their work. Nothing could be more calculated to destroy science than this.

Indeed, the ignorance of science is even widespread among scientists themselves. My friends working on atoms and antennas know nothing of DNA. Few scientists have a broad view of more than the one field on which they depend for bed and board.

I see exotropism in the form of non-cooperation with newspaper science writers. We are trying to report the advances in science to the vast public. Our combined audience is more than 100,000,000. Yet we are met with rebuffs, recalcitrance and often with rudeness. When I cover a science meeting, I don't wear my press button. I have seen too many scientists go into catatonia when I approach them with it.

I feel that the scientist does not cooperate because in addition to his exotropism he fears to be misunderstood, fears malignment at the hands of his colleague, and he fears to be understood.

The first fear is a normal one. Psychologists learned a long time ago that misunderstanding is more frequent than understanding. Information theorists call this "loss in the Line." Yet some misunderstanding is the price of understanding. As a human being with a story to tell, the scientist is no more unique than the politician or the writer and he ought to be willing to pay this small price.

For our part we make every effort to report accurately and clearly what scientists have reported to us or to their fellows. Sure, we make mistakes. Sure, some of us sensationalize. Sure, we sometimes embarrass you. But I believe, and the effort I'm making now is to make you believe, that it's worth the price.

We are trying to identify science with the public. We do it within a framework of newspaper publishing that has its own traditions. What comes out may not be a scientific treatise, but it is almost always an accurate summary of what has been said. The result is that the reader comes away with the same understanding that he would have had had he talked to the scientist directly.

The second fear merely requires better understanding on the part of scientists of the role of news reporting in science. When that happens scientists who get their names in the paper will no longer hear the sneers of their fellows: "We saw your ad, Joe."

The third fear, that of being understood, comes from the insecurity many scientists have toward their work. They know it is tentative, as all scientific knowledge is, and they fear that if their work is understood, the public may reject the science because of its tentative character. The job, of course, is to educate the public to live with temporary truth. This can be done by telling the public as much as possible about science.

Ignorance of science will breed public fear as it already has with respect to research funds. And instability will mean the extinction of science and its traditions.

The Rapid Selector

RALPH R. SHAW

Director, United States Department of Agriculture Library, Washington, D. C.

EDITOR'S NOTE: *An exhibit, featuring explanatory photographs of the Rapid Selector, will be shown in the Exhibit Hall at the AIBS Gainesville meetings. Dr. Shaw will be one of the speakers, September 7th, on the special symposium, "The Communication of Research Results," planned by the AIBS Publications Committee.*

THE fundamental principle of operation of the Rapid Selector is no different from the operation of the familiar "electric-eye" door-opening device. In the door-opening device, a beam of light shines on a photocell, which converts energy received in the form of light into an electrical current. The current emitted by a photocell is tiny and must be amplified. This amplified current, in the case of a door-opening device, serves in effect as a brake, i.e., so long as the current flows, the door is kept closed. However, when someone walks through the light beam, he interrupts the light beam. The instant the light beam is interrupted, the photocell stops putting out its electric current, and the door-opening mechanism is permitted to open the door.

The same principle is used in the electronic selector, except that the pattern of light is coded to identify the person or subject for whom the door is to be opened, so that the current from the photocell cuts off only for a preselected code. When the current from the photocell is interrupted, the electronic brake goes off. This permits a flash lamp to spark for two-millionths of a second producing, through an auxiliary camera, an enlarged print of the data on the microfilm which corresponds to the code which has been selected.

Objectives of Electronic Selection

There appears to be at least three broad areas in which electronic rapid selection and reproduction may be useful.

The first of these quite obviously appears to be the use of the Rapid Selector as a means for reducing storage space while permitting rapid finding and reproduction. In the first model of the Rapid Selector, 72,000 frames of material are stored on a 2,000-foot reel of film. These frames may be of any size, up to a legal-size sheet. Seventy-two thousand sheets of paper would occupy approximately three hundred cubic feet of space in a normal filing room eight feet high. In addition to the text pages stored on the film, however, the other half of the film provides space for as many as 430,000 index entries. 430,000 index entries stored normally on 3 x 5 index cards would occupy approximately eight hundred cubic feet of space. Thus, the text and accompanying index entries on a single roll of film would require approximately eleven hundred cubic feet of space, as against approximately a quarter of a cubic foot required for the film form. This means that the Rapid Selector uses approximately two hundredths of one per cent of the space required for comparable storage and indexing of the originals. Furthermore, the Selector provides for instantaneous reproduction of copies, and that is not provided in conventional storage.

A section of wall shelving of standard height and about twelve feet long could hold approximately twenty million pages of text and approximately one hundred twenty million index entries, as filmed for the first model of the Rapid Selector.

Use of microfilm for storage of large amounts of material in a minimum space is not a new idea. However, before the development of the Rapid Selector, microfilm could not be used economically for storage of live records. It was confined to more or less dead storage of long runs of little-used materials. Even for that type of use the material had to be very carefully prearranged to permit finding. The use of microfilm for live materials, into which frames must be inserted, was quite impracticable, and its use for random storage of information was utterly impossible because of the difficulty of locating material on the film.

A second field of application of rapid selection and reproduction would appear to be the field of cumulative indexing of materials from various sources, rather than control of material in a single file. A thorough search of the literature of chemistry, for example, may require the handling of dozens, or even hundreds, of volumes of indexes. Once this material from all the indexes is coded into film, the time required for electronic searching should be a tiny fraction of the time required for manual searching.

If Chemical Abstracts were available in coded form in the Selector, hundreds if not thousands of hours spent by chemists in the mechanical job of searching would be saved. At the present time a chemist may have to spend anywhere from a half a day to a week or more searching Chemical Abstracts before he can undertake a new research project. When Chemical Abstracts has been coded into the film, the chemist would still have to do the intellectual job of determining what phases or fields should be searched. He would then merely consult a code book comparable to the Decennial Index of Chemical Abstracts and send the numbers he wants searched to the machine operator. The clerk operating the machine would send him copies of all the abstracts under these subjects in a very few minutes, and the mechanical part of the searching job would be eliminated, thus freeing professional time for the research.

The third area of possible usefulness of the machine appears to be the possibility of improvement in the quality of organization of knowledge both for administrative routines and for communication among scientists.

The greatest limiting factors in the organization of knowledge appear to have been purely physical factors of cost and bulk. In fact it might even be said that substantially all of our schemes for organizing knowledge have been based to a certain extent upon physical factors or at least have been affected by compromises based upon physical factors.

The electronic selector, through its compression of the physical data and its ability to run hundreds of thousands of places in less time than we can walk to one, takes us one large step further along in dealing with the intellectual content of literature by greatly reducing the importance of the physical factor. While even with electronic selection it is possible to postulate bulks of material so great that appreciable time and cost are involved, the physical limitations may possibly be reduced so greatly that for a long time to come they may be considered negligible. Thus it should be possible to record every concept, no matter where it occurs, into the record permanently, in such form that it may be produced more rapidly than we can search now for our more limited coverage, and at lower cost than we now achieve limited coverage.

In this respect the capabilities of the machine appear to be ahead of our thinking. This third area of application is stressed because it appears that, while useful results may be achieved merely by using the machine to do more speedily and efficiently what we can now do, as indicated in the first and second areas of application discussed above, a really important contribution to the advancement of science will result only if we can re-think the methods of organization of knowledge to take full advantage of the new technique. It would appear that we need first to do some fundamental thinking and some operational research to determine what is really needed for the advancement of scientific communication and for the advancement of science. Until we know that, it appears doubtful that we will make fullest possible use of any mechanism.

The Selector has been termed a "thinking" machine or "electronic brain." Without more knowledge of what "thinking" consists of, it is difficult to say whether the Selector thinks or does not think. Certainly in the common sense of the term the Selector is not a thinking machine. It merely stores vast amounts of data and sorts and reproduces them in accordance with instructions given to the machine both in the coding and in the selection. All the machine ever does is to match black dots (or if you prefer, light dots) with complementary dots in an interrogating card. The only answer the machine ever gives is "yes" or "no." If the answer is "no," i.e., the dots do not match, the machine runs along and nothing happens. When the answer is "yes," a flash lamp is triggered to make a copy of a text frame which is predetermined in the coding and which the machine cannot change. The only thing the machine does is to store and reproduce data in accordance with whatever instructions are stored or called for by human minds. The coding system can be based on a numerical classification scheme, alphabetical classification scheme, or no scheme at all. It is utterly immaterial insofar as the operation of the Selector is concerned, and that, indeed, may be one of its greatest advantages, since it can accept any or all schemes of organization of knowledge and can, theoretically at least, use them all at once or separately, depending only upon the thinking that has gone into the design of the coding pattern in the interrogating card.

Use of machines for bibliographical purposes is developing, and it is developing rapidly. There will be a time lag in their application, just as there was with the typewriter. Their general and effective application may require ten years—or it may require a hundred. Determination of the length of this time lag rests entirely upon our ability to develop adequate statements of our requirements and adequate systems for utilization of machines for scientific management of the literature.

Annual Meeting of the American Institute of Biological Sciences—1953-54

T. C. BYERLY

Chairman of the Governing Board

THE annual meeting of the Governing Board was held in the Board Room of National Academy of Sciences-National Research Council Building on May 14, 1954. It was preceded by a short meeting of the Executive Committee of the Board. Vice-Chairman J. C. Walker presided until T. C. Byerly arrived in the afternoon.

The meeting of the Executive Committee and of the Board was concerned primarily with a discussion of ways and means of overcoming the deficit (see financial report at the end of this article) that will result from the termination of the grant from the Rockefeller Foundation. The Board frowned upon acceptance of another grant, except in case of extreme emergency; instead, the Board advocated measures which, if successful, would increase membership of individuals in AIBS and would increase income from dues. As the detailed plan for obtaining greater financial support for AIBS from biologists themselves has not yet been approved by the Board, it will not be described here, but will be presented in the October issue of the *Bulletin*.

During the year 1953-54 the National Association of Biology Teachers became a member of AIBS, increasing the circulation of the *AIBS Bulletin* from about 12,000 to about 15,000. This gain was offset by the decision of the American Physiological Society to drop from membership to affiliate status. Under the constitution of AIBS this change will not become effective until one year has elapsed following notification to the Board of intention to terminate membership.

During the same period the following changes occurred in affiliate status: Three societies became affiliates of AIBS; i.e., the American Dairy Science Association, the American Ornithologists' Union, and the Society of Protozoologists. One society, the American Society of Mammalogists, withdrew from affiliate status. There was no change in the number of Associates. The roll at the end of the year, therefore, showed a net gain over the previous year; i.e., from 17 to 18 member societies, from 10 to 12 affiliate societies.

At the annual meeting the events and accomplishments of AIBS during the year were reviewed and are summarized in the following paragraphs.

AIBS Activities

(covered in the appended financial report)

The AIBS Bulletin

A series of inspirational editorials, written by prominent biologists, was begun in the July 1953 issue of the *Bulletin*. Reprints of these editorials are available at cost to high school and college counselors and others interested in placing them in the hands of students to assist in career guidance. Articles were published on the agencies and organizations supporting research and on other organizations of importance to biologists. The series, "Know Your Societies," was completed during 1953. The listing of about 160 private bibliographies has been completed. The editorial staff reviewed 109 books in four issues. A column entitled "From the Editor" was begun in the October 1953 issue.

Plans for 1954-55, assuming that the *Bulletin* will receive the financial support needed, call for an issue on communications in science, including the trends and problems of scientific journals, magazines, newspaper science reporting, and books; a manuscript on the role of biologists in industry; and a series of articles on the biological stations, museums, and herbaria of the United States. It is also intended to publish factual accounts of the biological operating procedures and research of the associates (companies interested in biology) of AIBS, called "Know Your Associates."

The Publications Committee

Although interested in the *AIBS Bulletin*, this committee leaves editorial guidance of the *Bulletin* to the Editorial Board and concerns itself with the whole field of communications in biology. Under the leadership of William R. Duryee the Publications Committee has been very active. Not only have full fall and spring meetings been held, but there have been a number of informal meetings of the chairman with local members of the committee.

The committee has given much attention to means for facilitating the utilization of existing knowledge. Taking advantage of a development made by one of its own members, Ralph R. Shaw, Librarian of the U. S. Department of Agriculture, the committee has encouraged the further development and completion of a commercial model of Shaw's Rapid Selector, which, with the aid of a coded subject index (the preparation of this is also being encouraged), will select and photograph at high speed abstracts of desired subjects from a reel of 35 mm. film. Ultimately, a biologist who wishes to know what has been done on a given subject, will go first to a code book instead of to the index of an abstract journal and by machine search and recording of abstracts identified through the code, he will be spared the time and labor of manually searching for and recording the desired information.

Milton O. Lee's subcommittee on centralized business and editorial services for biological journals prepared a detailed plan for the initiation of a central office where business and editorial routines could be efficiently and economically performed for a number of journals.

Vocational Guidance

An agreement has been made with Russell B. Stevens to write for high school seniors a booklet on "Life in the Life Sciences," or some such title, with the help of information to be provided by the biological societies. The text is to be appropriately illustrated and, by contract already signed, is to be published by the Row, Peterson Company of Chicago. Dr. Stevens has completed his outline of the contents and has written the first draft of a large portion of the text. Comments and criticisms of this draft are now being solicited from high school and other sources.

Placement Service

As a result of action taken by the AIBS Executive Committee at its September meeting in Madison, the Placement Service was reorganized. Essentially three changes were authorized:

1. A graduated scale of registration fees was adopted whereby each registrant pays a fee for participation. Fees are as follows:

a. for Members of AIBS Member Societies	$ 2.00
b. for Members of AIBS Affiliate Societies	5.00
c. for all others	10.00
d. for "confidential" listing	20.00 per yr.

Registrants in classes a, b, and c receive listing in one Placement List and active registration for six months.

2. The fee charged to employers was reduced from $5.00 per copy of the Placement List to $1.00 per copy.

3. The number of issues of the Placement List was reduced from four to two per year, and information published about each registrant was increased.

The number of registrants in the December List totaled 135. Information about the Placement Service was sent to over 600 prospective employers. Copies of the List were sent to Associates, Member, and Affiliate Societies. The number of subscribers is now 80. Persons are being placed through the Placement Service, and its growth has been most encouraging.

Scientific Manpower Commission

During the year the commission made available information concerning the deferment of graduate students. This information was sent to all AIBS societies.

Meeting of Biological Societies

Hiden T. Cox reported arrangements are being made according to schedule for the meeting to be held from September 5 to 9, 1954, on the campus at the University of Florida in Gainesville. 26 societies are planning to meet at this time. An NABT-sponsored, NSF-supported conference on biological education in the Southeast, will take place at the University from August 28 to September 6.

The Nominating Committee

The nominating committee (R. E. Cleland, Chairman, R. W. Gerard, and W. N. Hess) proposed and the Board elected the following, who will take office July 1, 1954: H. Bentley, Glass, Chairman (for one year, succeeding T. C. Byerly); W. O. Fenn, Vice-Chairman (for one year, succeeding J. C. Walker); and Albert C. Smith (for three years as a member of the Executive Committee, succeeding W. N. Hess). T. C. Byerly, as retiring Chairman, remains a member of the Executive Committee for one year.

Activities Associated With AIBS

(not covered in the appended financial report)

The following activities are placed administratively in AIBS but are supported entirely by public and private agencies outside of AIBS. Two of them (the Advisory Committees to the Office of Naval Research and the Register) are extremely important to AIBS proper, giving much and taking nothing for services rendered.

Advisory Committees to the Office of Naval Research

The Advisory Committee in *Biology* (Frank A. Brown, Chairman) met in Washington, D. C. on May 28 and 19, 1953, at which time 32 new and renewal proposals for research grants were considered. During August 1953, the committee considered 5 research proposals by mail. The spring meeting of the committee was held in Washington, D. C., on April 5 and 6, 1954. At this time 26 new and 15 renewal proposals were considered.

The fall meeting of the Advisory Committee in *Hydrobiology* (Robert W. Hiatt, Chairman) was held in Madison, Wisconsin, on September 7, 1953, during the AIBS meetings. A progress report of the Hydrobiological Directory and publication plans for the Directory were discussed. Future projects and policies of the committee were discussed. On April 7, 1954, a meeting of the committee was held in Washington, D. C. A final report on the Hydrobiological Directory was given. Plans were made for a Symposium to be given in December at Berkeley and there was discussion of a proposed international conference of directors of marine biological laboratories.

A special conference on the Configuration of Polypeptide Chains, arranged by the AIBS in conjunction with the *Biochemistry* Branch of ONR, was held at the California Institute of Technology, Pasadena, on September 21-26, 1953. On November 16, 1953, 16 new research proposals and 10 renewal proposals were considered by the Biochemistry Advisory Committee (Severo Ochoa, Chairman) at a meeting held in Washington, D. C. The spring meeting of the committee was held in Atlantic City on April 11, 1954. At this time 8 new and 10 renewal proposals were considered.

Fourteen new proposals were evaluated by the *Physiology* Advisory Committee (Ralph W. Gerard, Chairman) at a meeting in Washington, D. C., on November 7, 1953. The spring meeting of the committee was held in Atlantic City on April 16, 1954, at which time 12 new proposals and 6 existing projects were considered.

The first meeting of the Advisory Committee in *Physiological Psychology* (W. J. Brogden, Chairman) under AIBS auspices was held at the Harvard Psycho-Acoustic Laboratory in Cambridge, on December 4 and 5, 1953. Past activities of the committee and functions of the new AIBS committee were discussed. Five research proposals were discussed at this time.

National Register of Scientific and Technical Personnel

In setting up the National Science Foundation, Congress directed that a Register of Scientific and Technical Personnel be maintained as part of a central clearinghouse for information. Under a grant from NSF, AIBS is administering the collection of data for biologists who belong to AIBS societies and for members of other societies who designate AIBS as their agent. Approximately 26,000 questionnaires have been distributed since October 1953. The rate of return is about 60%. Information taken from the questionnaires is being punched into IBM cards for inclusion in the Register. Negotiations are underway with NSF for extension of the grant for another two years.

Handbook of Biological Data

Distribution of "Standard Values in Blood," the first published monograph issued by the committee, has totaled, to date, 3,645 copies, of which 1,500 were distributed by the Air Force and 2,145 by W. B. Saunders Company, the commercial publisher. Sales are now averaging 300 copies a year.

"Standard Values in Nutrition and Metabolism," the second tabular monograph issued by the committee, is now in press at Wright Field. It contains 223 pages of tables and 16 pages of diagrams, with accompanying bibliography and index.

The same high standards of authoritativeness that determined the exclusion of all controversial or questionable material from the volume on Blood have been adhered to in the preparation of the volume on Nutrition and Metabolism. The material included represents accepted fact (or in certain instances, theory held in high esteem) according to the consensus of judgment of the experts in the field.

The committee is now entering the final phase of preparation of the Handbook of Biological Data, involving selection of 500 pages of condensed tabular material from the voluminous mass of data that has been acquired. Data on hand but not included in the 500 pages will be kept intact and catalogued. It is purposed to publish the catalogue and through it make the library of data available to biologists who may wish to consult it. The data will also serve as source material for the expansion of the Handbook in subsequent editions and for any other tabular monographs, devoted to special fields, that the AIBS may decide to publish.

On July 1, 1954 E. C. Albritton becomes Consulting Editor of the Handbook. W. S. Spector, previously Dr. Albritton's first assistant, becomes Managing Editor of the Handbook and Executive Secretary of the Handbook Committee. In effect, Dr. Albritton retires from the daily grind of the Handbook project and becomes editor emeritus. The first Handbook of Biological Data will be ready for publication not later than the middle of 1956.

Institute of Animal Resources

The Institute of Animal Resources (O. N. Eaton, Executive Secretary) is concerned with U. S. resources in laboratory animals; not only mammals, but also other vertebrates and invertebrates. It is supported by contributions from several interested government and private agencies.

The institute began operation on a full-time schedule on July 1, 1953. Two sets of questionnaires, one for producers and the other for users of laboratory animal stocks, were circulated to these two groups in order to make a preliminary survey of production, needs for and uses of various kinds of laboratory animals, as well as to get information concerning their genetic characteristics, nutrition, and diseases. Nearly 500 questionnaires were sent out, but only 40 percent were returned. From the experience and information gained, revised questionnaires will be prepared in order to obtain more detailed information and to make a wider coverage of both producers and users of laboratory animals.

The information resulting from this survey and other information collected by various committees of the institute are being assembled for publication as a handbook, which will appear in the summer of 1954. Since it will be incomplete in several respects, its circulation will be limited. Supplements and revisions will appear from time to time.

FINANCIAL REPORT

For the Period 7/1/53-6/30/54:

(Estimated for the last quarter of the year)

RECEIPTS

Rockefeller Foundation		$10,000
Membership Dues:		
Members	$11,515	
Affiliates	1,200	
Associates	4,250	16,965
Bulletin:		
Advertisers	7,956	
Subscribers	486	
Reprints	374	8,816
Placement Service		406
Business Office Income		1,236
Convention Income		10,735
TOTAL RECEIPTS		$48,158

EXPENDITURES

Salaries		$17,835
Office Operation:		
Office supplies, postage, equipment	$ 1,295	
SMC representative	500	1,795
Travel (AIBS staff and committees)		2,526
BULLETIN:		
Printing	9,884	
Addressing	442	
Postage	160	
Subscription	220	
Miscellaneous	26	10,732
Addressograph maintenance		1,485
Placement service		323
Addressograph services		815
Convention		10,190
NAS-NRC Overhead (5%)		2,285
TOTAL EXPENDITURES		$47,987
Balance		$ 71

AIBS Budget for Fiscal Year 1954-55 (Estimated)

RECEIPTS

Member Dues	$10,870
Affiliate Dues	1,200
Associate Dues	3,850
Bulletin	9,000
Convention	9,000
Miscellaneous	2,000
	$35,920

EXPENDITURES

Salaries	$19,000
Office equipment and supplies	300
Office services and mail	1,000
Travel (staff and committees)	2,600
Scientific Manpower Commission	500
Bulletin	12,000
Convention	7,000
Miscellaneous	2,600
	$45,000
NAS-NRC Overhead (5%)	2,250
	47,250
Deficit	$11,330

EDITOR'S CREED

Appearing through the courtesy of Dr. Horace Stunkard, who, like so many editors, can repeat the words with great feeling and understanding.

If you've got a thought that's happy—
Boil it down.
Make it short and crisp, and snappy—
Boil it down.
When your brain its coin has minted,
Down the page your pen has sprinted,
If you want your effort printed,
Boil it down.

Take out every surplus letter—
Boil it down.
Fewer syllables the better—
Boil it down.
Make your meaning plain—express it,
So we'll know—not merely guess it,
Then, my friend, ere you address it,
Boil it down.

Skim it well—then skim the skimmings—
Boil it down.
Trim it, then retrim the trimmings—
Boil it down.
When you're sure 'twould be a sin—to
Cut another sentence in two,
Send it in, and we'll begin to—
Boil it down.

Anonymous

MEETING OF BIOLOGICAL SOCIETIES

Sponsored by

American Institute of Biological Sciences

UNIVERSITY OF FLORIDA

Gainesville, Florida

September 5-9, 1954

INFORMATION ON HOUSING

DORMITORY ACCOMMODATIONS: University Dormitories will be available for housing couples and families as well as single delegates. Accommodations will be available also in hotels and motels in the City of Gainesville.

DORMITORY ROOMS MAY BE OCCUPIED: Any time from noon on Sunday, September 5th until 10 a. m. on Thursday, September 9th.

PRE- AND POST-MEETING HOUSING: Arrangements should be made by individual delegates through Dr. John Henry Davis, Department of Botany, University of Florida.

RESERVATIONS: Dormitories—May be made from now until September 2nd. Payment is to be made at check-in time. Hotels and Motels—May be made from now until September 2nd. The University Division of Housing will make reservations for you in off-campus housing but will not guarantee them.

RATES: Per Person in Dormitories, Sunday evening to Thursday at $2.25 per night. Hotel, $5.00 up. Motel, $5.00 up.

ACKNOWLEDGMENT: Each advance reservation received before August 26th will be acknowledged by a form which should be presented at the registration desk in September. Registration will be in the Main Lobby of Broward Hall, Inner Drive.

MEALS: No set cost. Cafeteria style with exception of banquets. Delegates will pay for and receive banquet tickets at registration.

TO MAKE ADVANCE REGISTRATION: Please fill out the registration form below and mail to:

D. W. Vermilye, Director
Division of Housing—Dept. "A"
University of Florida
Gainesville, Florida

(PLEASE TYPE OR PRINT ALL INFORMATION)

REGISTRATION AND HOUSING APPLICATION

Name..... Male ☐ Female ☐
(first) (middle) (surname)

Home Address:..... (street)

..... (city) (zone) (state)

Expected Time of Arrival:..... (date, hour)

Full Names, Sex, Relationship of Members of My Party:

.....

.....

.....

Departure:..... (date, hour)

Arrival: By Train ☐
By Plane ☐
By Car ☐

Professional Address:.....

Title:.....

Institution:.....

Society Membership:

(1).....

(2).....

(3).....

Please make reservations for me (and my party) in:

Dormitories ☐
Hotel ☐
Motel ☐

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PRIVATE BIBLIOGRAPHIES

Continued from page 15

69. BACTERIAL PLANT DISEASES. A. J. Riker, Dept. of Plant Pathology, University of Wisconsin, Madison 6, Wisconsin. Period: 1926-1950. Approx. 3,000 references. Selective. Not geographically limited. Mostly annotated. May be seen.

70. MEDICAL MYCOLOGY. Libero Ajello, U. S. Public Health Service, Communicable Disease Center, P. O. Box 185, Chamblee, Georgia. Period: 1839 to date. Approx. 3,500 references. Selective. Not geographically limited. Unannotated. May be seen.

71. NITROFURANS. R. J. Main and B. R. Anzlowar, Eaton Laboratories, Norwich, N. Y. Period: to date. Approx. 600 references. Not geographically limited. Section on clinical use, veterinary medicine, laboratory and biology, synthetic chemistry. Mimeographed bibliography in short supply. May be seen.

72. PTERIDOPHYTES. Clyde F. Reed, 10105 Harford Road, Baltimore 34, Maryland. Period: 1753 to date. Approx. 10,000 references. Inclusive. Not geographically limited. Annotated in part. May be seen.

73. ISOETALES. Clyde F. Reed, 10105 Harford Road, Baltimore 34, Maryland. Period: to date. Approx. 364 references. Published 1953 in Bol. Soc. Broteriana 27: 5-72.

74. MARSILEATA AND SALVINIATA. Clyde F. Reed, 10105 Harford Road, Baltimore 34, Maryland. Period: to date. Approx. 310 references. In press.

75. CULTURE OF PLANTS WITHOUT SOIL. William C. Whitman, Horticulture Dept., Rutgers University, New Brunswick, New Jersey. Period: to date. Approx. 2500 references. Annotated. World-wide. May be seen at 38 Marvin Lane, University Heights, New Brunswick, New Jersey.

76. HEPATICOLOGY. Rudolf M. Schuster, Department of Botany, Duke University, Durham, N. C. Period: 1800 to date. Approx. 1,500 references. Selective for holarctic flora; phylogeny, morphology, and phytogeography. Largely annotated. May be seen.

Correction. In #1 (See Jan. 1954 *Bulletin*), Bibliography of Ida K. Langman. "Phytology" should read "Physiology."

Correction. In #38 (See Jan. 1954 *Bulletin*), Bibliography of Frederick A. Aldrich. "1926" should read "1826."

NOTICE to A•I•B•S Members

IF you are receiving *duplicate* copies of The AIBS Bulletin—

OR

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1954 RELEASES

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Introduction to

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By CARL C. FRANCIS, A.B., M.D., Associate Professor of Anatomy, Department of Anatomy, Western Reserve University, Cleveland, Ohio.
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This book attempts to present in the smallest possible compass the essential facts of human anatomy. Stress has been laid on the function of each part and on the integration of each tissue and organ of the body.

Arranged into units and subdivided into chapters, the material progresses from simple structures to the identification and location of the more detailed and intricate parts of the human body. The external and internal parts are named first, followed by the various systems which integrate and maintain body functions. The last unit describes the structure of the reproductive system.

Contents—UNIT I—THE BODY AND BODY TISSUES. The Body as a Whole. Surface Anatomy. Cells and Tissues. UNIT II—POSTURE AND MOVEMENT—The Skeleton. Articulations. Muscles. Unit III—INTEGRATIVE MECHANISMS—The Nervous System. Special Sense Organs. The Endocrine System. UNIT IV—MAINTENANCE OF THE BODY TISSUES—The Circulatory System. The Lymphatic System. The Respiratory System. The Digestive System. The Urinary System. The Skin and Subcutaneous Tissues. UNIT V—REPRODUCTION—The Female Reproductive System. The Male Reproductive System. GLOSSARY.

Principles of

MICROBIOLOGY

By CHARLES F. CARTER, B.S., M.D., Director, Carter's Clinical Laboratory, Dallas, Texas; and ALICE L. SMITH, A.B.M.D., Assistant in Pathology, Instructor in Microbiology and Pathology, Parkland Hospital, School of Nursing, Dallas, Texas.
Second Edition. 604 pages, 177 illustrations. Price, $5.00.

This book presents a brief general survey of the principles of microbiology with simple descriptions of the most important disease-producing microbes and a discussion of the reaction of the animal body to contact with them.

In this revision all chapters have been carefully studied. The general outline of the book remains the same as that of the first edition with the exception of an introductory chapter on the History of Microbiology. Included in this chapter are the "milestones" found at the end of the previous edition. Comparatively new developments which occupy the thought of microbiologists, such as the therapeutic use of gamma globulin, the activation of latent infections by the antibiotic drugs, the modern control of leprosy, and the more modern methods of disinfection and sterilization, have been included in this edition.

The section of sulfonamide compounds and antibiotics has been rewritten and enlarged. In all cases, so far as possible, the action of the sulfonamide compounds and antibiotics on each disease-producing agent is given. Little mention is made of therapeutic agents which were widely used only a few decades ago but which are now not commercially available.

TEXTBOOK of BACTERIOLOGY

By JOSEPH M. DOUGHERTY, A.B., M.A., Ph.D., Formerly Dean of the School of Science and Professor of Bacteriology, Villanova University; Fellow of the American Association for the Advancement of Science; and ANTHONY J. LAMBERTI, B.S., M.S., Instructor in Bacteriology and Parasitology, Temple University School of Medicine.
Third Editon. 598 pages, 190 illustrations. Price, $8.25.

The importance of the science of bacteriology in everyday life and the requirements of many avocations make the acquisition of the principles of bacteriology a distinct asset for the college graduate. This text aims to secure the interest of the large number of students who are required to study bacteriology.

This new 1954 edition has been completely revised and the number of chapters increased. Both the text matter and the illustrations have been increased by approximately 36% over the previous edition.

New chapters have been added on: The Growth and Death of Bacteria; the Bacteriology of Air and Soil; Normal Bacterial Flora of the Body; the Lactobacillus and Listeria Group; and Miscellaneous Bacteria. The original chapter on the colon-typhoid-dysentery group has been completely rewritten into four new chapters. The chapters on classification, morphology, chemistry, and metabolism of bacteria and the chapters on immunology and the viruses have been rewritten and brought up to date.

The footnote bibliographies have been removed and historically significant literature and symposia appertaining to the subject material covered has been placed at the end of each chapter. A number of photomicrographs and other illustrative material have been added in the new edition. Since the undergraduate student is not primarily concerned with therapy, the authors have eliminated the chemotherapy section in their discussion of the various infections.

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by Stanley E. Wedberg

Associate Professor of Bacteriology, University of Connecticut

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May, 1954 *439 pp.* *$4.50*

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Story of a purse-proof cigarette

A pack of Luckies in a lady's purse is assaulted by the penetrating odors of perfume, powder, hand lotion, lipstick.

That makes a problem for the cigarette manufacturer, because tobacco is remarkably absorbent . . . sensitive to moisture and odors. The makers of Lucky Strike, therefore, do everything they can to keep foreign odors away from the cigarettes . . . to make Lucky Strike as purse-proof as humanly possible.

Cellophane plays the biggest role in giving you factory-fresh taste in every pack of Luckies. For that reason, the Research Laboratory of The American Tobacco Company subjects every lot of cellophane used on Luckies to an immersion test, an impermeability test, strength tests, tests for freedom from flaws. Even after the packs are wrapped, the cellophane seals are spot-tested to make sure they're airtight.

This is one small example of how the Research Laboratory scientifically checks every one of the hundreds of steps in the manufacture of Lucky Strike cigarettes. Such diligent attention to detail explains why we print an unconditional guarantee on every pack of Luckies.

The American Tobacco Company

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